PROJECTIONIST

INTERNATIONAL

MARCH 1951

VOLUME 26 • NUMBER 3

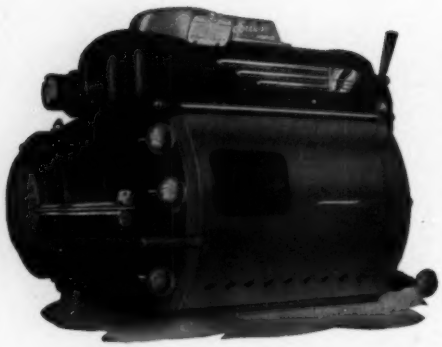
30c A COPY • $2.50 A YEAR

7 out of 10 choose Peerless MAGNARC

TRADE MARK REG.

1-KW TO 70 AMPS

"HY-AX" ARC MAGNET
"HY-LUMEN" REFLECTOR



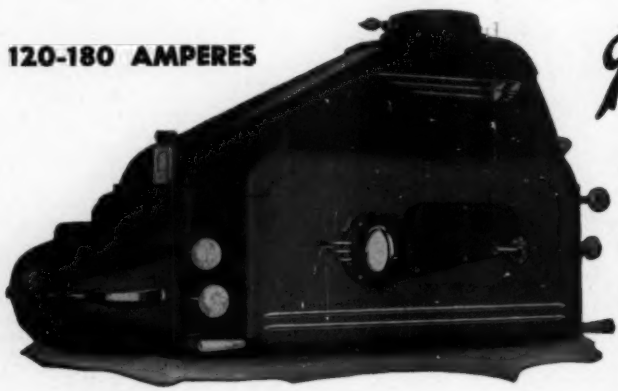
More light at 40 to 70 amperes than ever thought possible. . . . Equals and excels any reflector lamp to 85 amperes, whether they be unapproved water-cooled or resurrected "Hi-Lows". . . . Highest ratio of *honest* screen lumens per arc watt . . . At 70 amperes, using an accurated Glass Hy-Lumen Reflector*, with a projector having an efficient revolving shutter, it develops the maximum screen brilliance that can be used without a heat filter at no risk of film damage. . . . Operating costs under these conditions are far below that of 85-ampere lamps.

Magnarc Lamps assure 80% side-to-center (SMPE Standard) screen light distribution, not a deceptive 60% or "Hot Center." . . . They are all Und. Lab., Inc. listed. . . . They are not insurance hazards. . . . They are and have been for years "The First Choice" of large and small theatres, drive-ins, and the motion picture industry.

*Similar results are not guaranteed if *all-metal reflectors* are used

"FIRST WITH THE FINEST"

120-180 AMPERES



Peerless HY-CANDESCENT

TRADE MARK REG.

NEW MAGNETIC STABILIZER

This modern lamp produces all the light there is . . . It is the standard equipment of the nation's largest and finest theatres. . . . Used by 90% of the largest Drive-In Theatres.

It is the "Omega" for maximum screen brilliance . . . Nothing can even approach it in white light volume when used with projectors that have efficient revolving shutters.

Assures satisfying projection for Drive-Ins regardless of the size of the picture, length of throw, and under all weather conditions. . . . They are Und. Lab., Inc listed and, therefore, not insurance hazards. . . . Heat filter assures no risk of film-heat damage at maximum arc amperage and maximum screen lumens.

"WHY EXPERIMENT?"

J. E. McAULEY MFG. CO.

552-554 WEST ADAMS STREET
CHICAGO 6, ILLINOIS

INTERNATIONAL PROJECTIONIST

With Which Is Combined PROJECTION ENGINEERING

HENRY B. SELLWOOD, *Editor*

Volume 26 MARCH 1951 *Number* 3

Index and Monthly Chat 3

Film-Guiding in the Projector 5
ROBERT A. MITCHELL

Theater Television *via* the RCA PT-100 Equipment, IV 9
RCA SERVICE COMPANY

Projectionist Examination Questions 10

New Eastman Identification System for Safety Film 12
KODAK RESEARCH LABORATORIES

Effects of Television on the Motion Picture Theater 17
BEN SCHLANGER and WILLIAM A. HOFFBERG

In the Spotlight 18
HARRY SHERMAN

IA Elections 20

The Cathode-Ray Tube: Basic Data 21
JOHN F. RIDER and SEYMOUR D. USLAN

Variable Shutters in 16-mm Filming 23
JOHN F. FORBES

Letters to the Editor 24

RCA Theater-Tv Price Slash 25

News Notes

Technical Hints

Miscellaneous Items

Published Monthly by

INTERNATIONAL PROJECTIONIST PUBLISHING CO., INC.

19 West 44 Street, New York 18, N. Y.

Telephone: MUrray Hill 2-2948

R. A. ENTRACHT, Publisher

SUBSCRIPTION REPRESENTATIVES

AUSTRALIA: McGills, 183 Elizabeth St., Melbourne

NEW ZEALAND: Te Aro Book Depot, Ltd., 64 Courtenay Place, Wellington

ENGLAND and DOMINIONS: Wm. Dawson & Sons, Ltd., Macklin St., London, W. C. 2

YEARLY SUBSCRIPTION: United States and possessions, $2.50 (two years, $4); Canada and foreign countries, $3; single copies, 30 cents. Changes of address should be submitted two weeks in advance of publication date to insure receipt of current issue. Entered as second class matter February 8, 1932, at the Post Office at New York, N. Y., under the act of March 3, 1879.

Entire contents copyrighted 1951 by International Projectionist Publishing Co., Inc. INTERNATIONAL PROJECTIONIST is not responsible for personal opinions appearing in signed articles in its columns.

MONTHLY CHAT

ONE of the most encouraging news items in many a day was the recent move by RCA to slash the price of its theater Tv system from $25,000 to $15,800. And the frosting for this palatable tidbit was the announcement that RCA was moving along in high gear production-wise, with no present indication that a shortage of Tv system elements will seriously hamper this production effort for some months to come.

This RCA move followed on the heels of the recent acquisition by 20th Century-Fox of the rights to the Eidophore (Swiss) system of large-screen Tv, a happenstance which is viewed in some quarters as having impelled the RCA price cut.

Now is posed the $64 question, in two sections: first, what will Mr. Exhibitor do now that his moaning about the high cost of Tv equipment has been stifled? and second, even if the exhibition field displays the best will in the world to get theater Tv rolling, what aid will be given by the FCC in terms of allocating channels so that motion picture theaters may be afforded at least a fighting chance to stay on an even keel? This is quite apart from the extremely involved matter of proper program fare.

Nor is Mr. Exhibitor the only one concerned here: projectionists and every other member of the organized crafts in the industry has a big stake on the line —their livelihoods. In fact, during an informal discussion at a recent exhibitor gathering the suggestion was voiced that the labor organizations in the industry, in particular the IA, should come to the aid of the theaters by advancing up to $500,000 for Tv equipment in about 100 theaters in key cities across the country.

It is not known how the labor organizations would react to such a proposal, but the idea is by no means fantastic.

However all this may be, the expansion of theater Tv now rests squarely in the lap of the FCC, for it is incredible that the film industry, if given the opportunity, would not devise some means for solving the problem of equipment finances and programming.

Now is the time for all groups within the film industry to put aside their own selfish interests and strive mightily for the common good—and this advice is pointed directly at the film distributors who have yet to curb their voracious appetites in terms of exorbitant film rentals. And the organized crafts within the industry can make a signal contribution to the solution of this knotty problem, and this without renouncing one whit of their hard-earned right of collective bargaining. Working together as a team, this problem is by no means insoluble.

Failing a cooperative effort by all concerned, it is difficult to see how the once-proud film industry can emerge from the box-office doldrums.

"VICTORY CARBONS" are back to conserve copper for defense

VICTORY CARBONS
DESIGNED TO CONSERVE COPPER FOR DEFENSE NEEDS
Due to government curtailment of copper, the carbons contained in this package are manufactured with a decreased thickness of copper coating. The maximum current rating has been reduced by 5 amperes and is stamped on each carbon.
National
ARC CARBONS
National
ARC CARBONS

A National emergency has been declared. Our country is in grave danger. National Carbon Division is helping to conserve vitally-needed copper for use in defense . . . by putting a thinner coating on the following sizes of projector carbons:

8 mm x 14" "SUPREX" Positive
8 mm x 12" "SUPREX" Positive
7 mm x 9" "OROTIP" "C" Negative

7 mm x 14" "SUPREX" Positive
7 mm x 12" "SUPREX" Positive
6 mm x 9" "OROTIP" "C" Negative

The above carbons will be called "Victory Carbons" and will operate at the reduced currents shown:

Maximum 65 amperes—8 mm "SUPREX" Positives
7 mm "OROTIP" "C" Negative

Maximum 45 amperes—7 mm "SUPREX" Positives
6 mm "OROTIP" " Negative

There will be enough carbons to go around. The only change will be in the thickness of the copper coating. "Victory Carbons" aren't new. They helped us in the last war. They are helping us now to prepare for the next one, if it comes.

The terms "National", "Orotip" and "Suprex" are registered trade-marks of

NATIONAL CARBON COMPANY
Division of
UNION CARBIDE AND CARBON CORPORATION
30 East 42nd Street, New York 17, N. Y.

District Sales Offices: Atlanta, Chicago, Dallas, Kansas City, New York, Pittsburgh, San Francisco
In Canada: National Carbon Limited, Toronto 4

VOLUME XXVI MARCH 1951 NUMBER 3

Film-Guiding in the Projector

By ROBERT A. MITCHELL

INTERMITTENT units and projection lenses have often been blamed for picture defects actually caused by film gates, or "traps," which were worn, misaligned, or otherwise maladjusted. Projectionists who operate in a large number of theatres as relief men or service engineers occasionally encounter projectors clogged with dirt and oily grime —positive indications of neglect. Removal of the accumulated dirt frequently reveals mechanical troubles which can, and often do, have a deleterious effect upon the projected picture.

The mechanical and optical tolerance of the film gate's various parts are so critical that the slightest amount of wear and maladjustment can prevent the gate from holding the film perfectly flat and motionless over the aperture during the 24 definite intervals each second when the intermittent is "at rest." A lateral or a longitudinal extraneous movement of the film of only 0.01 inch will show up on a 24-foot screen as a sidewise or an up-and-down picture movement of nearly 3 inches! And a deviation from perfect flatness of the film by the same amount, or even less, will cause one side or corner of the picture to be badly blurred when the central areas are in focus.

Older Gates Unsatisfactory

Even a perfect intermittent unit cannot produce a rock-steady picture without a trace of flutter and side-sway when the gate fails in its function. Neither can even the best lens work against such a handicap.

The gates of the older projectors are manifestly unsatisfactory. The antiquated Powers, for example, utilizes a very short gate (about 3 frames of film in length), and accordingly requires a powerful pad tension to prevent overshooting when brand-new prints are shown. The poor construction of the gate is the principal reason why Powers-projected pictures frequently have fits of violent "jumping." The projectionist can only risk film damage by increasing pad tension beyond safe limits.

The old Simplex "Regular" is another case in point. The gate of this machine —originally the Edengraph—is vastly superior to the Powers gate. It is longer, it has more evenly distributed pad tension, it is fitted with an effective cooling plate, and it has a larger flanged guide roller which, unlike the Powers roller, is easily adjusted for correct lateral placement of the film over the aperture. But the single guide roller of this machine, and of others patterned after the old Simplex, is not sufficiently effective to eliminate all side-sway from the picture.

Pad Tension Adjustment

The pad tension provided in the older projectors was another source of projectionist dissatisfaction. This tension should be decreased when running new prints which are apt to "stick," and increased for well-seasoned prints. It was difficult to change the tension of the pads, or shoes, because the springs had to be taken out of the gate door and bent with the fingers. The busy projectionist was thereby forced to resort to guesswork, and he could not bring about the desired changes in pressure on the film when old and new prints were run on the same program.

The situation was also confused by differences of opinion. One projector manufacturer declared flatly that fixed pad tension represented the best projection practice, and he cautioned the projectionist not to attempt to alter the tension provided at the factory. This, of course, was many years ago.

All of these constructional flaws have received the close attention of projector designers in recent years; and all but a few of the newer projectors have better gates than the best of the old-time machines. We find improved edge-guiding of the film and readily adjusted pad tension. In some cases alloy steels of superior wearing qualities are used for the tension shoes and film runners.

An examination of all the different projectors, both old and new, discloses three general types of film gates. These are represented in Fig. 1. Gate *A* is the old type, now obsolete. It depends for lateral guiding of the film upon a single flanged guide roller placed at the top of the main casting.

Gate *B* represents an attempt to improve the film-guiding by placing a metal guide rail at each edge of the film track. Gates having "studio guides," as these rails are called, are found in the Motiograph K, the Simplex E-7 and X-L, and the Brenkert projectors.

Gate *C* has no studio guides, but uses instead a second guide roller positioned a

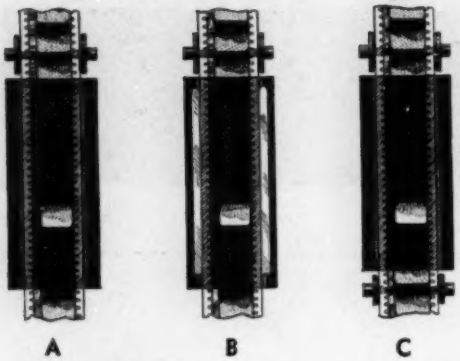


FIGURE 1

Three main classes of film gates: A—gate with no guiding-edge facilities except a single guide roller assembly at top of main film-trap casting; B—gate with guide roller and guide rails, and C—gate with two guide-roller assemblies.

short distance below the aperture. This type of gate is an exclusive feature of the Motiograph AA. Fig. 2 shows the actual construction of this advanced type of film gate.

Curved Gate an Aid

In addition to these the *curved gate* may be added as a fourth class. The reader will recall that the Super Simplex adapted for the projection of 70-mm Grandeur film utilized a curved gate. Theoretically, the curvature of the Grandeur gate is in the wrong direction for good optical functioning of the lens—the concavity, not the convexity, should face the lens.

In the SUPA line of projectors we see the curved gate correctly engineered. These British projectors are found on this side of the Atlantic mostly in Canada; and while they are unnecessarily complicated and possess features which make them seem very crude in comparison with American projectors, the curved gate impresses the writer as a distinct advance in projector design. Possibly, Mr. R. H. Cricks, Technical Editor of *Ideal Kinema* (London) had this feature in mind when he lavished praise upon the chain-geared SUPA.

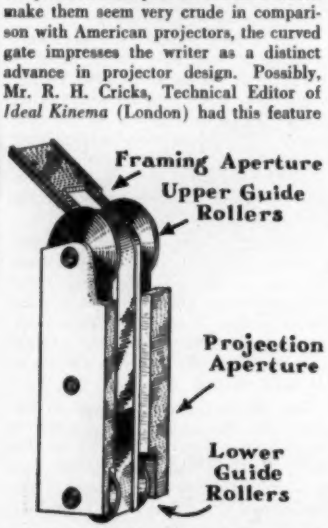


FIG. 2. Construction of the Motiograph AA film gate. Two sets of guide rollers are used to insure accurate edge-guiding of all film.

The so-called flickerless projector exhibited at a TESMA convention in 1947 was an experimental model using a curved gate. Film-buckling is eliminated by the use of this gate.

It is now time to ask a few questions—questions which occur to all projectionists who try to evaluate the various gate constructions now in use. Are the additional edge-guiding facilities of modern projectors really necessary? Which is better, studio-guide aligning or the use of two sets of guide rollers, upper and lower?

No one knows *all* about equipment. The "expert" is sometimes wrong; and the ordinary projectionist is often right. Manufacturers hire skilled engineers and conduct mechanical, optical, electrical, and even chemical, tests unceasingly, often being more critical of their own products than are its users.

The development of the projector shutter from the single front shutter to the rear disc-shutter, and then to the combination front-and-rear shutter, and finally to such forms as the cylindrical and the conical shutters, is indicative of the great progress made. So also is the development of new types of film gates.

Varied Experience Suggested

Projectionists can increase their knowledge of the newer projectors by taking a look-see at as many different makes as possible. Visiting the projection rooms of theatres having different brands of equipment cannot fail to help the projectionist to form a sound opinion as to which projectors are really the best.

A comparison of the newer and older film gates makes a good subject for study on field trips. This study should be followed up by actually threading up different makes of machines with film, noting the ease of threading, and then examining critically the performance of each type of gate. The old-style gate is a good one to begin with.

Figure 3 is a diagram of the standard type of guide roller used in these machines. The flange at the outer edge (sound track side) of the film is fixed, and therefore determines the lateral position of the film. The other flange is moveable, and is caused to press in upon the opposite edge of the film by a small coil spring. The entire assembly rotates upon pivot bearings.

The fixed flange of most guide rollers is provided with a set-screw to permit lateral adjustment. It is extremely important that the guide-roller assembly be properly centered in order to avoid the appearance of either the sprocket-hole margin or the soundtrack on the screen.

If a brand-new print be lubricated by smearing oil in an irregular manner over the perforation margins (a practice certainly not recommended!) a noticeable side-sway will be introduced into the picture when projected with one of the older machines.

Now, an appreciable amount of varying *slippage-difference* exists between the two sprocket-hole margins of practically all films. Side-sway thus exists *in potentia*; and any differences in the pad tension applied to the two margins of the film greatly increase the likelihood of annoying side-sway.

The possibility of side-sway may also be tested, and without messing up film, by pressing against each edge of the film, first one edge and then the other, *very lightly* with the back of the fingernail just below the intermittent sprocket. If any lateral movements of the picture appear on the screen during this test, the possibility of spontaneous side-sway is great with the mechanism used. Such a test must be conducted with caution in order to avoid injury to the fingers or damage to the film.

Use of 'Studio Guides'

In order to overcome this trouble several manufacturers sought improvements in gate construction. Motiograph was the first to use studio guides. These appeared in the Motiograph K in 1936. Later Brenkert and Simplex (in the E-7) adopted them. These two manufacturers still use studio guides in their latest models.

(*Continued on page* 32)

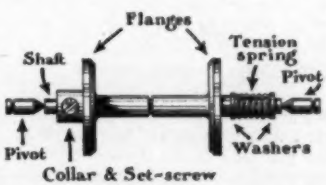
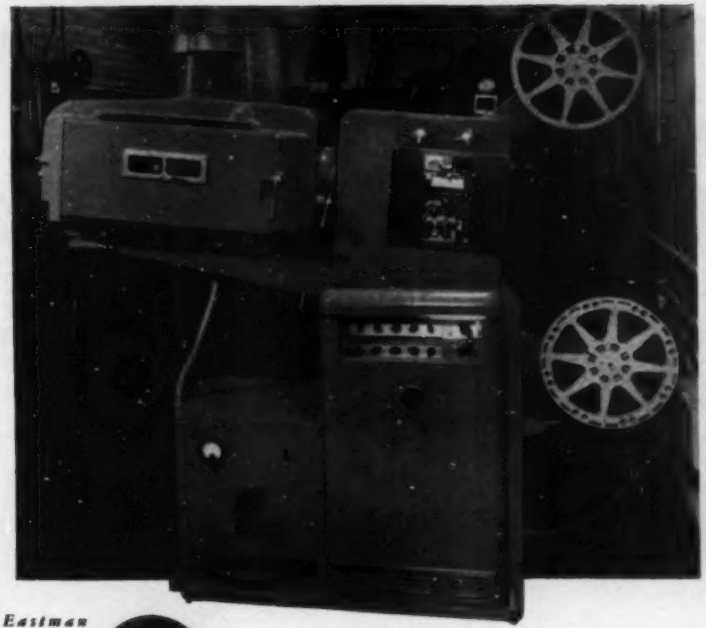


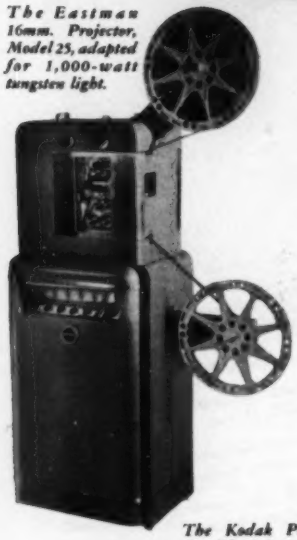
FIG. 3. A standard guide-roller assembly. Note the set-screw by means of which the roller may be adjusted laterally.



Left, the Eastman 16mm. Projector, Model 25, brings 16mm. projection to the professional level. Shown here, adapted for arc illumination, permanently installed alongside 35mm. equipment.

Below, working parts of the film movement mechanism are in constant view of the operator . . . readily accessible for threading and cleaning.

The Eastman 16mm. Projector, Model 25, adapted for 1,000-watt tungsten light.



The Kodak Projection Ektar Lens, in a choice of four focal lengths, insures superior screen image.

For Professional Quality Sound Projection from 16mm. Film

The Eastman 16mm. Projector, Model 25

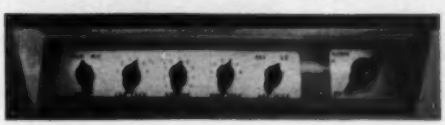
This projection instrument—built to a new design concept—eliminates the three major obstacles to theatrical quality 16mm. sound projection . . . excessive wear and high maintenance cost; low signal-to-noise ratio; and excessive flutter.

A major cause of excessive wear and poor quality sound is the constant transfer of shock forces generated in the film pulldown mechanism to other parts of the system. In the Eastman 16mm. Projector, Model 25, the intermittent (film advance mechanism) is completely isolated and independently driven by its own 1440 r.p.m. synchronous motor. Thus, shock forces are sealed off from the rest of the instrument. The sprocket-shutter system is driven by its own 1800 r.p.m. synchronous motor. Exact phasing between the two systems is accomplished by specially designed synchro-mesh gears. In addition, the take-up spindle, rewind spindle, and blower are driven by separate motors.

A highly corrected microscope objective, adjustable for optimum sound quality from any type of 16mm. sound film, permits reproduction of variable area or variable density 16mm. sound tracks at extremely low distortion and a maximum signal-to-noise ratio.

To get the best out of any 16mm. sound film, project it on an Eastman 16mm. Projector, Model 25. For information on installation, availability, and prices, write directly to the Motion Picture Film Department, Eastman Kodak Company, Rochester 4, N. Y., or any branch office.

Motion Picture Film Department, Eastman Kodak Company, Rochester 4, N. Y.



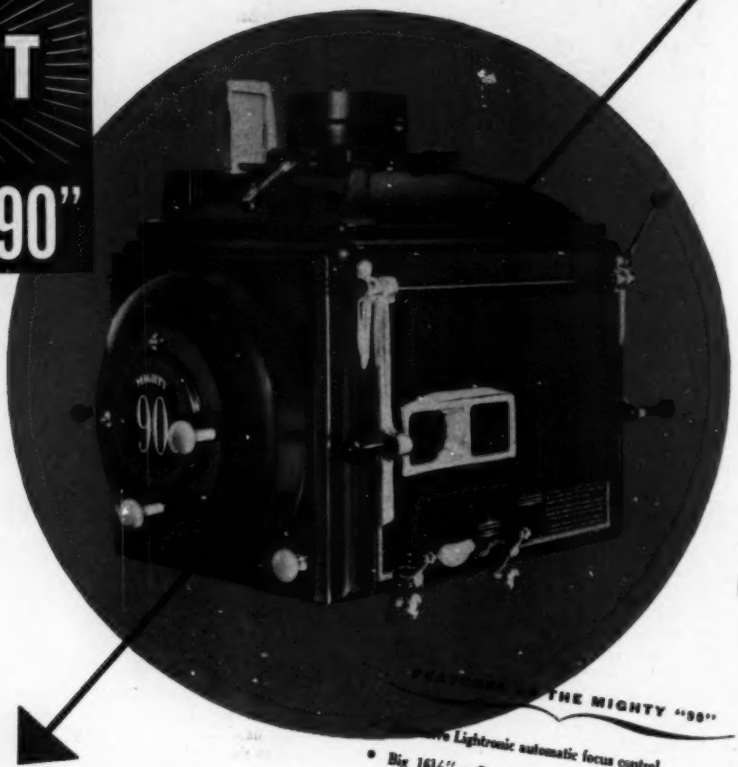
East Coast Division
342 Madison Avenue
New York 17, N. Y.

Midwest Division
137 North Wabash Avenue
Chicago 2, Illinois

West Coast Division
6706 Santa Monica Blvd.
Hollywood 38, California

BRIGHTEN UP YOUR PICTURES WITH THE LIGHT OF THE MIGHTY "90"

the lamp that does more than just deliver the most light . . .



FEATURES OF THE MIGHTY "90"

- ...ve Lightronic automatic focus control.
- Big 16½" reflector, the largest used in any lamp, matches high speed f/1.9 lens.
- Forced air cooled feed mechanism. Low operating temperatures. Rugged burner mechanism.
- Bi-Metal Lightronic tube controls both carbon feed motors. Simple feed rate adjustment.
- Air stream arc stabilization. Complete combustion of black soot. White deposit on reflector prevented.
- Unit construction permits instant removal of major components.

The Strong Mighty "90", 75 to 130 ampere reflector arc lamp, not only delivers positively the most light that can be projected to any screen, REGARDLESS OF HOW LARGE, but at 90 amperes projects 21,000 lumens AT FAR LESS COST than other types of big lamps!

As the only lamps produced complete within one factory, Strong lamps can be engineered to obtain these high efficiencies and fine screen results.

As the world's largest manufacturer of projection arc lamps, Strong has a line that includes lamps especially designed for best results under every condition. Send coupon today for free literature.

THE STRONG ELECTRIC CORPORATION
3 City Park Avenue
TOLEDO 2, OHIO

☐ I would like a demonstration of the Strong Mighty "90" in my theatre without cost or obligation.

Please send free literature on the ☐ Mighty "90"; ☐ Mogul Lamp; ☐ Utility Lamp; ☐ Strong Arc Spotlamps; ☐ Strong Incandescent Spotlights; ☐ Strong Rectifiers; ☐ Strong Reflectors.

NAME

THEATRE

STREET

CITY & STATE

Theater Television

via the RCA PT-100 Equipment

By TECHNICAL PRODUCTS DIVISION, RCA SERVICE CO., INC.

IV. Image Projection Equipment Data

THERE are several major differences between the theater television projector and the conventional home receiver. These are necessary mainly because of the larger size of the projected picture, the fact that the theater television projector is used for coaxial or microwave programs as well as broadcast programs, and the fact that it is designed for commercial applications.

Because of the larger size of the projected picture, and the increased illumination thereby required, the picture produced on the Kinescope screen must be much more brightly illuminated than that produced on a home receiver. This corresponds exactly to the fact that the picture aperture of a motion picture projector is illuminated to a much higher level than that of a photograph which is viewed directly.

Neither the projection Kinescope nor the frame of film in the aperture of the picture projector can be viewed directly without a protective glass to reduce the blinding brilliancy of the light. In order to produce this high light level, more voltage and more current must pass through the projection Kinescope than through the one in the home receiver.

80,000-Volt Anode Potential

The RCA PT-100 projector utilizes a Kinescope which is especially designed to be used with an anode potential of 80,000 volts, and a beam curent of approximately two milliamperes, as contrasted with 10,000 volts and several microamperes for the home receiver Kinescope.

In order to successfully withstand such high voltage, the theatre projection Kinescope is made with an insulating outer coating on the large part of the tube. In addition, this part of the Kinescope is made with corrugations, or "petticoats," around it to increase the surface leakage path for the applied voltage. The internal coating on the face of the Kinescope is covered with a thin backing of aluminum to equalize the voltage and reflect as much light as possible out through the front of the tube.

The high voltage is obtained from a power unit of the type used with high-powered X-ray equipment. This unit comprises a high-voltage transformer; a voltage-doubling rectifier, with filter capacitors and resistors; a voltage-regulating circuit, and safety relays to short-circuit the high voltage circuits when the applied A-C power is turned off.

All components are immersed in a steel tank filled with insulating oil. A tap is taken from the internal resistors to obtain 20,000 volts for the third grid of the projection Kinescope. The 20- as well as the 80,000-volt outputs are fed out of the steel tank by means of high-voltage cables protected by steel conduit; these cables run in this conduit to the inside of the metal projector barrel. Thus, there is no unprotected cable exposed. The power supply and control wiring for this unit is, of course, also run in conduit to the control racks.

Power Supply Controls

To prevent variations in the size of the projected picture due to line voltage fluctuations, the D-C supplies for the deflection amplifiers, video amplifier, oscilloscope, and synchronizing and switching amplifiers are all electronically controlled.

A-C power for the vertical deflection amplifier, the horizontal deflection amplifier, one rectifier-power supply, and the 80,000-volt power supply is controlled by an automatic voltage-regulating transformer. Thus, the normal variations in A-C line voltage are prevented from affecting the operation of the projector.

As the Kinescope is located at a distance from the monitor and control racks, which are in the projection room, it is necessary to use a cable to feed power to the Kinescope for moving the electron beam up and down and back and forth on the Kinescope screen. Because it is necessary to feed the deflection power at low voltage and fairly high current, a coaxial cable is used, as it is most practical for this purpose. The deflection yokes on the Kinescope are specially wound to operate from this low-voltage, high-current supply.

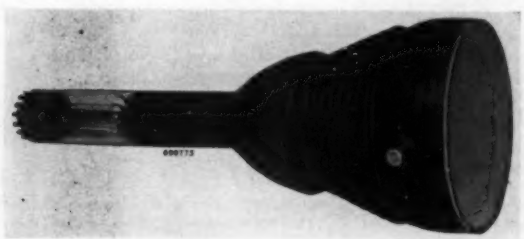
The video (or picture) amplifier is located at the projector barrel, so the capacity in the high-level video output circuits is held to a minimum. In this way, signals reaching the control elements of the Kinescope have the full 8-megacycle range that the equipment is capable of handling.

Unique Adjustment Features

Several unique features are incorporated in the projection room rack equipment. A special oscilloscope is provided for testing and adjusting the peak-to-peak input voltage signal to be sure that it is adequate to fully control the picture circuits. A built-in switch allows the projectionist to check the calibration of this scope when necessary. This feature is intended to prevent picture failure which might otherwise occur from unknowingly trying to utilize a weak input signal.

There is also a monitor Kinescope which produces a miniature picture from the incoming signal, or, at the projctionist's discretion, of the signal after amplification in the video amplifier which is located in the projector barrel. This double-checks the incoming signal for picture content and the amplifier signal for distortion or other possible defects. It also helps the projectionist to cue changeovers from one program to another, as it can be switched to either of two incoming signal lines, and thus enables him to see one program while at the same time projecting the other on the theatre screen.

A monitor jack and phone headset are



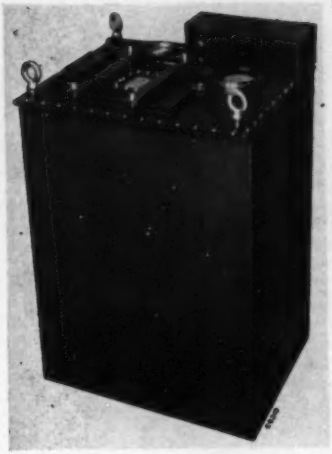
The 7NP4 projection Kinescope used with the RCA PT-100 theater Tv system.

"Is it too late, Doctor?"

Fortunately, it's *not* too late for more and more Americans who are going to their doctors *in time* ...at the first sign of any one of the seven danger signals which *may* mean cancer: (1) any sore that does not heal (2) a lump or thickening, in the breast or elsewhere (3) unusual bleeding or discharge (4) any change in a wart or mole (5) persistent indigestion or difficulty in swallowing (6) persistent hoarseness or cough (7) any change in normal bowel habits.

By showing Americans what they can do to protect themselves and their families against cancer, the American Cancer Society is saving thousands of lives *today*. By supporting science and medicine in the search for the causes and cures of cancer, the Society hopes to save countless more *tomorrow*. To guard yourself, and those you love, against cancer, call the nearest office of the American Cancer Society or address your inquiry to "Cancer" in care of your local Post Office.

American Cancer Society



Power supply unit for RCA theater Tv system.

also provided for listening to the incoming sound signal on either line. Again, it is possible to listen to some other line than the one being fed to the sound system in the theatre.

Special Beaded Screen Used

In order to provide maximum illumiation in the theatre seating area, the screen used with the RCA theater Tv projector is of the beaded type. This construction is similar to that employed in screens for the usual 16-mm home projectors. The millions of small glass beads act as individual lenses which reflect the incident light back into the useable area instead of scattering it over he entire auditorium. Thus, the amount of light reaching the patrons' eyes is increased and waste light reduced.

Two benefits are obtained in this manner: in addition to the increase of light to the patrons' eyes, the contrast of the screen to the theare walls is increased; the walls are left darker, and therefore the eyes are more relaxed and eye pupils opened to the extent encouraged by the screen brilliancy.

All high-voltage circuits are protected by covers with interlock switches which cut power from the equipment when the covers are opened. This prevents accidental contact and assures maximum safety for operating personnel.

The projector barrel is mounted on a pair of trunnion legs to allow it to be tilted up or down the required amount to center the picture vertically on the screen. Although a certain amount of centering adjustment may be done with the rack controls, it is desirable to keep the picture as near the center of the Kinescope face as possible; therefore, the picture is first centered on the tube and then the barrel is aimed at the center of the screen. Side-to-side adjustment is obtained by moving the trunnion legs in the required direction at the point where they are attached to the mounting framework on the balcony front or other support.

Mounting the projector from the balcony or other theatre structure must be done in a safe and secure manner. As individual balcony structures differ in their design, the design of the mounting platform on each installation is left in the hands of a competent architect or structural engineer.

[NOTE: The fifth article of this series will contain additional detailed data anent the theater Tv projection equipment, in addition to information on operating procedure.]

Projectionist Examination Questions

Based on Examinations by Leading U. S. Municipalities

1. Upon striking squarely a transparent medium that is of even density and homogeneous throughout, light will (*a*) be refracted upwards; (*b*) be refracted downwards; (*c*) travel through it in perfectly straight lines, or (*d*) be diffused party upward and partly downward.

2. If a generator supplies current to its circuit at 114 volts, and each main wire has a drop of 3 volts in it, what voltage is impressed on the lamps?

3. Motion picture film should be cleaned with a soft cloth saturated with (*a*) modified laundry soda solution (*b*) kerosene (*c*) commercially pure carbon tetrachloride, or (*d*) hot water in which has been dissolved a small quantity of soft soap.

4. The lens formed by cementing or placing two plano-convex lenses together is called (*a*) collector (*b*) concave (*c*) meniscus, or (*d*) bi-convex.

5. That quality or property of a lens which causes differently colored light to come to a focus at varying distances from the optical center of the lens is called (*a*) spherical aberration (*b*) chromatic aberration (*c*) lens action, or (*d*) refraction.

6. How do electrolytic condensers differ from other condensers?

7. Name the principal parts in a Geneva projector movement.

8. To obtain a 20-ft. picture at a throw of 90 ft., what size lens is needed?

9. Can you explain exactly what action takes place in a rectifier tube?

10. Can you name the main elements of a push-pull amplifying circuit and describe their function?

ADDENDUM

To the Editor of IP:

Question No. 7 of the examination question in IP for February (p. 10) is in error. The question was:

> Having an alternator with 12 poles and a speed of 1200 R.P.M. and a frequency of 60 cycles, at what speed must a synchronous motor travel to be in step with it if it has 8 poles?

Now, no alternator with 12 poles and a speed of 1200 R.P.M. will result in 60 cycles. The speed would have to be 600 R.P.M. The reason for this lies in the relationship between the number of poles (*p*) of the machine, its speed of rotation (*n*) in R.P.M., and the frequency (*f*) of the induced voltage in cycles per second, as follows:

At *f* cycles per second the induced voltage has a frequency of $60 \times 2 f = 120 f$ of alternations, because each cycle corresponds to two alternations. During one revolution of the machine *p* poles pass under each group of conductors, thus inducing *p* alternations. Consequently, the number of alternations per minute, is pn, so we have $120 f = pn$.

Now, getting back to Question 7:

$$120 \times 60 = 12 \times n$$

$$n = \frac{120 \times 60}{12} = 600 \text{ R.P.M.}$$

not 1200 R.P.M. Now, for an 8-pole synchronous motor to be in step, it would go like this:

$$120 \times 60 = 8 \times n$$

$$= 900 \text{ R.P.M.}$$

Not looking for any medals for the old eagle-eye stunt, but I think so highly of IP that I don't like to see an error of this nature stand uncorrected.

DON FRETCH
IA Local 164, Milwaukee, Wisc.

OOPS—and you're so right, Mr. Fretch. Anyhow, the crimson hue of our face is bleached a bit by the gracious manner in which the correction was tendered.—ED.

From Five to 450 Emulsion Coatings

The emulsion coating department of Eastman Kodak Co.—where light-sensitive photo emulsion is coated on film base—used a stock of five emulsion coatings in 1906. Today that number has risen to more than 450, including several multi-layer coatings for color film. Total film production has increased many times in that period.

Westrex Recorders for Signal Corps

The U. S. Signal Corps has just acquired 14 newareel recording systems from Westrex Corp., New York. Eight of these systems included Wall single-system sound cameras.

New Eastman Identification System for Safety Film

The circulation side-by-side of both nitrate and acetate (safety) release prints has imposed severe demands upon the resources of the film manufacturer, the laboratory, the exchanges—and last, but by no means least, upon the projectionist who must deliver the sum total of industry effort, from story conception down through the manifold stages to the delivery of the finished product to the paying patron at the theater box-office.

Ever responsive to the requirements of the man who keeps the theater going, (Mr. Projectionist), Eastman Kodak Company has developed a system of print identification which should go far to ease the burden of projectionists, who utilize its product to translate a narrow ribbon of film into the dollars which provide the economic sinews for the world-wide operation of motion picture theaters. This article was prepared and is copyright by Eastman Kodak Company.

PROPER identification of nitrate and safety film, of course, is of paramount importance if accidents are to be prevented. The only safe practice is to assume that all 35-mm motion picture film is nitrate unless demonstrated otherwise.

A safe, simple, foolproof method for identifying nitrate and safety film correctly is not as easy as it might seem. For many years film manufacturers have printed the words "NITRATE FILM" at frequent intervals along the edge of film made on nitrate base, and the words "SAFETY FILM" along the edge of film made on safety base. This has usually been done by a latent image exposure at the time of slitting or perforating, and when a nitrate positive is printed from a safety master and a safety duplicating negative. The nitrate print carries not only its own identifying name in black but the words "SAFETY FILM" in white

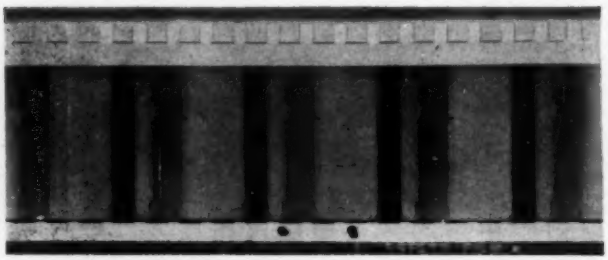


FIG. 1. A print on nitrate stock showing conflicting identifications printed through from a safety master positive and a safety duplicating negative.

the identification is visible only after processing.

This identification system was adequate as long as only nitrate film was used for professional 35-mm theater productions. Now that both nitrate and safety films are in general use, there is the danger of misidentification caused by printing through from a safety negative onto a nitrate print, or *vice versa*.

Figure 1 illustrates what can happen printed through from the safety duplicating negative, and the same in black printed through from the safety master positive.

Obliteration of Markings

The original identifying name on a piece of film usually appears sharper than one resulting from a second generation print, but there is still a real danger of misidentification. In Fig. 2 is the reproduction of a portion of a print on safety film which was found in the trade. A sample had to be burned to establish the identity of the base. Both black-and-white and color prints have also been seen frequently with a flash along the edge which virtually obliterates the nitrate or safety identification.

Additional limitations to this system of film identification are the fact that it is invisible in the raw stock and that every individual spliced strip of processed film in a roll must be examined.

It is thus apparent that the existing system of nitrate and safety base identification is entirely inadequate. Eastman Kodak Company has given a great deal of thought to this problem in recent years because of its importance in fire prevention. Many ideas have been suggested and it has finally been concluded that two separate identification systems for safety film are necessary. Two such systems are now being put in practice as follows:

Distinctive, Visible Frame-Line Printing

A scheme has been devised by which identification of the base can be combined with visible frame-line printing as shown in Figs. 3 and 4. Eastman Nitrate Motion Picture Positive, Sound Recording, and Duplicating films carry a width-

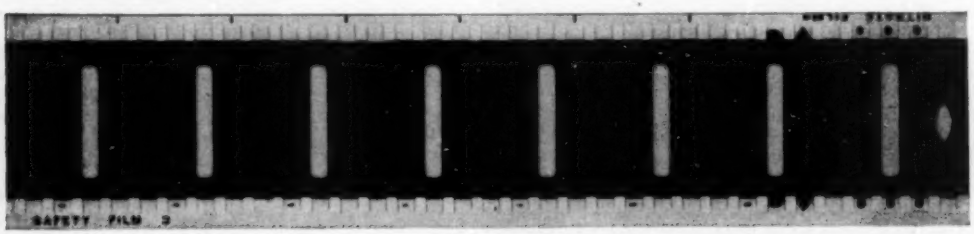


FIG. 2. A portion of a print on safety film stock found in a film exchange. Note confusion of identifying names. The correct identity can be established by the presence of the safety frame-line mark. (See Fig. 3.)

SHOWMANSHIP is better than ever—with RCA Theatre Sound

RCA SOUND
. . . completes the illusion of reality

REALITY OF PICTURE IS NOT ENOUGH . . . the sound, too, must be as real as life itself for the greatest possible enjoyment of the show. Today, the natural and pleasing sound made possible by RCA High Fidelity Sound Equipment successfully completes the illusion of reality.

RCA is the recognized leader in the sound equipment field. RCA's more than 25 years' experience in research and manufacture of sound equipment for motion picture theatres, radio and television stations and sound systems for educational, industrial and commercial applications is your guarantee of highest quality.

The RCA Service Company assures you of expert installation and keeps your RCA Theatre Sound System running at peak efficiency.

THERE IS AN RCA SOUND SYSTEM FOR YOUR THEATRE

Ask your Independent RCA Theatre Supply Dealer for complete information

THEATRE EQUIPMENT

RADIO CORPORATION of AMERICA

ENGINEERING PRODUCTS DEPARTMENT, CAMDEN, N. J.

In Canada: RCA VICTOR Company Limited, Montreal

presenting
THE NEW STRONG TROUPERETTE
INCANDESCENT SPOTLIGHT
. . . for small theatres, schools, night clubs, TV studios and industrial shows, where physical dimensions and price are factors and where the tremendous light volume of an arc lamp is not necessary.

PROJECTS FAR MORE LIGHT THAN ANY CONVENTIONAL INCANDESCENT SPOTLIGHT

This increased brilliancy is made possible by a variable focal length objective lens system, a 5¼-inch silvered glass reflector, and Fresnel lens used with a standard 115-volt, 1000-watt prefocused projection type bulb.

As contrasted to the conventional incandescent spotlight, with which the spot size is varied solely by irising, to result in substantial light loss, the Trouperette utilizes all the light through most of the spot sizes.

6 1/2 TIMES BRIGHTER HEAD SPOTS

Sharp edges from head spot to flood. Horizontal masking control can be angled at 45 degrees in each direction. Fast-operating color boomerang accommodates six slides. Height-adjustable mounting stand.

Can be plugged into any 110-volt convenience outlet.

THE STRONG TROUPER HIGH INTENSITY ARC SPOTLIGHT

With variable focal length lens system for projecting a dazzling snow-white spot in larger theatres, ice shows, circuses, arenas, and coliseums.

Automatic arc control maintains a constant arc gap, free from hiss or flicker. A trim of carbons one hour and 20 minutes at 21 volts and 45 amperes.

Draws only 10 amperes from any 110-volt A.C. convenience outlet, making the use of heavy rotating equipment unnecessary. An adjustable, self-regulating transformer is an integral part of the base. Mounted on casters. Easily portable. Easily disassembled for shipping.

SEE ANY OF THE FOLLOWING DEALERS OR USE COUPON FOR OBTAINING LITERATURE

ALBANY, N. Y.— Nat'l Theatre Supply Co.; Albany Theatre Supply
ATLANTA—Nat'l Theatre Supply Co.
ATLANTIC CITY—Boardwalk Film Enterprises
AUBURN, N. Y.—Auburn Theatre Equipment
BALTIMORE—J. F. Dusman Co.; Nat'l Theatre Supply Co.
BOSTON—J. Citro, Inc.; Nat'l Theatre Supply Co.
BUFFALO—Dion Products; Nat'l Theatre Supply Co.
CHARLOTTE—Nat'l Theatre Supply Co.; Standard Theatre Supply Co.
CHICAGO—Abbott Theatre Equipment Co.; Gardner Jansen, Inc.; Hollywood Stage Lighting Co.; Midwest Stage Lighting Co.; Midwest Theatre Service and Equipment Co.; Nat'l Theatre Supply Co.
CINCINNATI—Nat'l Theatre Supply Co.
CLEVELAND—Nat'l Theatre Supply Co.
DALLAS—Hardin Theatre Supply Co.; Modern Theatre Equipment Co.; Nat'l Theatre Supply Co.
DENVER—Nat'l Theatre Supply Co.; Graham Bros.
DES MOINES—Nat'l Theatre Supply Co.
DETROIT—Nat'l Theatre Supply Co.
FORTY FORT, PA.—V. M. Tate Theatre Supplies
GREENSBORO, N. C.—Standard Theatre Supply Co.
HOUSTON—Southwestern Theatre Equipment Co.
INDIANAPOLIS—Nat'l Theatre Supply Co.
KANSAS CITY, MO.—Shreve Theatre Supply; Nat'l Theatre Supply Co.
LOS ANGELES—J. M. Boyd; C. J. Holzmueller; Nat'l Theatre Supply Co.; Pembrex Theatre Supply Corp.
LOUISVILLE—Falls City Theatre Supply Co.
MEMPHIS—Nat'l Theatre Supply Co.
MILWAUKEE—Nat'l Theatre Supply Co.; R. Smith Co.
MINNEAPOLIS—Minneapolis Theatre Supply; Nat'l Theatre Supply Co.
NEW HAVEN—Nat'l Theatre Supply Co.
NEW ORLEANS—Nat'l Theatre Supply Co.
NEW YORK CITY—Nat'l Theatre Supply Co.
NORFOLK—Nat'l Theatre Supply Co.
OKLAHOMA CITY—Nat'l Theatre Supply Co.; Oklahoma Theatre Supply Co.
PHILADELPHIA—Blumberg Brothers; Nat'l Theatre Supply Co.
PITTSBURGH—Atlas Theatre Supply; Nat'l Theatre Supply Co.
SALT LAKE CITY—Inter-Mountain Theatre Supply Co.
SAN FRANCISCO—C. J. Holzmueller; Nat'l Theatre Supply Co.; W. G. Preddey Theatre Supplies
SEATTLE—B. F. Shearer Co.; Nat'l Theatre Supply Co.
SIOUX FALLS—American Theatre Supply Co.
ST. LOUIS—City Electric Co.; Nat'l Theatre Supply Co.
TOLEDO—Theatre Equipment Co.
WESTERLY, R. I.—G. H. Payne Motion Picture Service
CANADA—
Dominion Sound Equipment, Ltd. Montreal, Quebec
General Theatre Supply Co. Montreal, Quebec
Perkins Electric Co., Ltd. Montreal, Quebec
Perkins Electric Co., Ltd. Toronto, Ontario
General Theatre Supply Co. Winnipeg
Sharp's Theatre Supplies, Ltd. Calgary, Alberta.

THE STRONG ELECTRIC CORP.
The World's Largest Manufacturer of Projection Arc Lamps
14 City Park Avenue
Toledo 2, Ohio

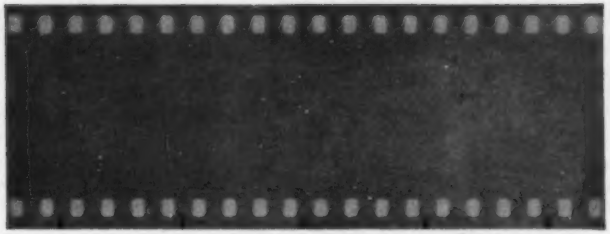
Please send free literature on the ☐ Strong Trouperette Incandescent Spotlight; ☐ Strong Trouper Arc Spotlight.

NAME_____

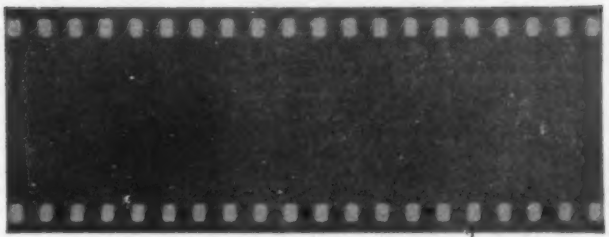
COMPANY_____

STREET_____

CITY & STATE_____



NITRATE FILM



SAFETY FILM

FIG. 3. The new Eastman visible frame-line mark on safety raw stock compared with nitrate.

wise frame-line mark after every fourth perforation printed along the extreme edge of the film.

Eastman 35-mm black-and-white Safety Motion Picture Positive Film now carries a lengthwise frame-line mark after every fourth perforation located exactly between the perforations instead of at the extreme edge of the film. This is the only area on the film which is ordinarily not exposed in printing. This new safety frame-line mark when used on safety negative film will not print through on positive film, provided that care is taken to see that printers never expose the area exactly between successive perforations.

A more positive identification is thus obtained — whenever the new safety frame-line mark is found, one can be reasonably certain that the film is on safety base regardless of nitrate frame-lines or nitrate edge printing which may have been printed through from the negative. If the safety frame-line printing is not present, the film is either on nitrate base or on safety base made prior to the use of the new frame-line.

Black Ink Now Used

Both the nitrate and safety types of visible frame-line printing are applied to the back of the film by means of black ink instead of by latent image exposure and, therefore, are visible on the raw film (Fig. 3) as well as on the developed film (Fig. 4). The ink used will withstand processing solutions and normal handling wear. Even if the film is flashed before development, the ink is visible by reflected light, although not by transmitted light.

The new safety frame-line mark has been used on 35-mm black-and-white Eastman Safety Motion Picture Positive Film since early in 1949. It will appear on all 35-mm Eastman safety motion picture films (both negative and positive types in black-and-white) as soon as the necessary equipment changes can be made—it is hoped, sometime during 1951. (All color films manufactured by Eastman Kodak Company are made on safety base but may not carry this new frame-line mark.) Of course, some Eastman safety film is already in circulation which does not have this new safety frame-line printing, but as time passes, this method of identification should prove of increasing value.*

Attention is drawn to the fact that nitrate film formerly manufactured by Canadian Kodak carried a visible frame-line mark running lengthwise of the film instead of widthwise, as in the case of Eastman nitrate film manufactured in the United States (Fig. 5). The Canadian Kodak nitrate frame-line mark was located at the extreme edge of the film. It may therefore be distinguished from the new Eastman safety frame-line mark located between the perforations. Thus *both* the direction and the location of the frame-line mark must be checked to establish the identification of the base.

A Fluorescent Edge For Safety Film

The new visible frame-line printing described above as a useful and necessary method for identifying safety film, but it also has its limitations. In a spliced roll, every separate strip would have to be examined to make sure that the entire roll including leader and trailer was safety film.

Correct identification of the whole roll is especially important for sorting films going into storage vaults where a small piece of nitrate film might damage other films. It is also important in sorting film for scrap recovery. In such cases, individual examination of every spliced strip would be very laborious and costly. It was felt that some rapid method of determining whether or not a roll of film is all safety is necessary.

The method which has been adopted

*A distinctive type of frame-line mark for safety base motion picture materials manufactured in foreign countries is also being instituted.

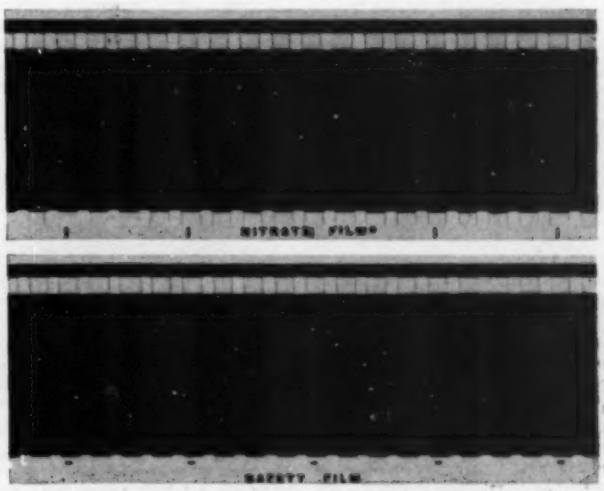


FIG. 4. The new Eastman visible frame-line mark on processed safety film compared with nitrate.

Proper Handling of Safety Film

SAFETY motion picture film requires no special precautions in handling or storage as far as its own fire hazard is concerned. Underwriters' Laboratories describe approved acetate film as slow-burning and state that "hazards in use and storage are small, being somewhat less than those presented by common newsprint paper in the same form and quantity." Where safety film is used exclusively, only normal fire precautions are required as in any office or building containing paper, wood, or similar combustible material. Safety films should be stored in individual cans in metal cabinets, but these need not be sprinklered or vented.

Where safety and nitrate films are both being used in studios, laboratories, exchanges, theaters, or storage vaults, the same regulations and precautions must be followed as if *all* the film were nitrate. It is, of course, entirely feasible to segregate the work involving safety film alone in any given studio, laboratory, or exchange, so that certain areas might be operated without the restrictions applying to nitrate film.

The only real hazard in acetate film is that its increased use will tend to make people careless, and proper safety precautions may be neglected while some nitrate film is still in circulation. If this happens, a serious accident may result.

Combination Safety-Nitrate Prints

A roll of film which is acetate base at the outside might contain nitrate film spliced in the interior of the roll. A print released on acetate stock may later have replacements made on nitrate stock and be run on a projector not properly maintained for nitrate film. A laboratory which has been using safety stock for release prints for a period of time may suddenly switch to nitrate stock without announcement or warning. The danger of such practices is obvious.

Even when no more nitrate film is being manufactured in the United States, foreign negatives or prints on nitrate stock may be imported. Another hazard is the quantity of nitrate negatives and prints in storage vaults, some of which may be kept for 25 years or more. Any such collection of nitrate films that is to be saved should be stored in a separate approved vault, never in the same vault with safety films.

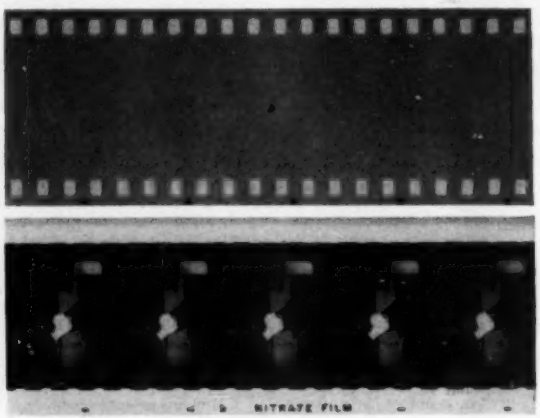


FIG. 5. The visible frame-line mark on raw and processed nitrate film manufactured by Canadian Kodak.

by Eastman Kodak Company is to apply a very small amount of a fluorescent chemical on safety film base used for 35-mm motion picture film. When a 35-mm roll of film so treated is viewed on edge under a suitable ultraviolet lamp in a partially darkened room, a vivid purple fluorescence is visible; whereas untreated film viewed in the same way appears black. In white light fluorescent-treated and untreated films look exactly the same.

Extensive tests in both the laboratory and the trade indicate that the fluorescent treatment of the base has no detrimental effect on the film before or after development.

This simple and effective method of rapidly distinguishing nitrate and safety film in bulk form is illustrated in Fig. 6 which shows a composite nitrate and safety film roll on an exchange reel. The same roll wound on a core is shown in Fig. 7. The nitrate film appears black and the fluorescent-treated safety film appears white in these reproductions.

The contrast between the two films is much more striking in actual practice or in a color photograph where the edge of the safety film appears purple. The exchange reel does not permit as complete an examination as in the case of a roll on a core, but it is still possible to tell quickly whether most of the roll is nitrate or safety.

A suitable inexpensive ultraviolet lamp in various table, overhead, portable, spot, or flood-light models may be purchased from several manufacturers complete with transformer and filter ready for use.** A 100-watt bulb is recommended for general use, but smaller or larger ones may be obtained if desired. The ultraviolet bulbs and other parts may also be purchased separately from electrical supply stores and assembled in standard fixtures.

The ultraviolet lamp should be equipped with a hood or reflector, and care should be taken not to expose the eyes for long periods to direct ultraviolet radiation from these lamps. Provided such care is taken, ultraviolet lamps present no personnel hazard. They are in constant use in various other industries.

(*Continued next page, foot of Col.* 1)

** For example, Switzer Brothers, Inc., 1220 Huron Road, Cleveland 15, Ohio, Black Light Model 181.

Figure 6

Figure 7

In Fig. 6 is shown a mixed roll of fluorescent-treated safety film (white) and untreated nitrate film (dark) on an exchange reel. (Photographed with ultraviolet light.) The edge of the treated safety film is actually colored purple, and the nitrate film black in ultraviolet light. Fig. 7 shows the same roll as in Fig. 6 but on a plastic core.

Effects of Television on the Motion Picture Theater†

By BEN SCHLANGER and WILLIAM A. HOFFBERG
Theater Architects and Engineers, New York City

The advent of television has accelerated the need for refinements and improvements in the art of the projected motion picture in theaters. The factors of cinematography, theater location, seating capacity and theater design have to be dealt with in accordance with circumstances which already appear to call for a fresh approach to the problem. It is important to evaluate the ability to adapt existing theaters to the new requirements.

HOME television is acquiring a mass audience, but there will always be a motion picture theater and theater television audience consisting of those patrons who wish to see entertainment not available in other mediums, those who wish to avoid advertising intrusions, those desiring a respite from the home environment, those satisfying their gregarious instincts, and those who prefer the dramatic impact of the large theater screen cinematography.

This audience may be surprising in numbers, because it has been estimated that only 10 to 20% of the potential audience ever attended even the most popular picture.

We are now going out of a period in motion picture history in which great leeway existed in both production and exhibition. The margin for error, incompetence, and acceptability of questionable quality of production and exhibition, is narrowing down with the advent of television.

Now, the factor of quality in motion picture theater entertainment will determine the size of its audience. Of course, quality primarily includes story content and performance, but if the motion picture theater cannot deliver the story content and performance in a manner far superior to any of the other entertainment mediums, it will lose the main reason for its existence.

Television has accentuated the necessity for intimacy in the motion picture theater because each home television seat is a "ringside" seat. The television camera is located at a distance and angle from the scene which the director considers most favorable to the home audience. At home, the television viewer has the great advantage of choosing his seating pattern by individual preference.

However, the scale of the television screen in the home is limited. The comparatively bright illumination levels required in home television viewing makes the viewer particularly conscious of this deficiency. The inclusion of furniture and room details in the field of view does much to destroy intimacy.

In contrast with home television, the motion picture theater has a fixed seating pattern. The theater audience seating preferences can readily be seen as they choose their seats at the beginning of the show. The less desirable seats are then reserved for latecomers.

Theater Improvement 'Musts'

The competition of home television can be a healthy stimulus to induce theater owners to improve their physical plant so that the enjoyment of a motion picture in a theater is noticeably superior. The following items deserve careful consideration in this connection:

1. All theater seat locations must be desirable. Unobstructed vision of the screen is mandatory. Ample row spacing and two arm rests for each seat will be necessary.

2. The scale of the theater screen image should increase so that the difference in scale as compared with the home television screen is accentuated and dramatized.

3. Since 1938, we have advocated the elimination of black masking around the motion picture screen, and we now have many successful installations of this type in theaters. The majority of television receiver sets have very light colored maskings. A luminous field around the screen, preferably synchronized with the screen lighting intensities, would reduce eyestrain and enhance peripheral cinematographical effects.

4. Some of the fluidity and inventiveness achieved in television production is worth noting. With the larger screen and luminous screen surround, the peripheral areas of the human field of view can be exploited for greater dramatic effect.

5. The effectiveness of distant panoramic views and medium shots on the television receiver is necessarily limited in scale. In contrast, the larger theater screen and the increased use and improvement of wide-angle camera lenses, are great advantages.

Larger Screen Size Feasible

6. Development of higher intensity projection equipment, coated lenses, and the reduction of film grain as well as the demands of drive-in projection, have made larger screen projection feasible.

7. Further enhancement of cinematography is produced by the increased subtended angle of the larger screen to the average viewer.

8. Items 2 and 3 of the foregoing recommendations can now help to bring three-dimensional motion pictures into use. With seating depth limited to approximately four times the picture width instead of the greater viewing depths now used, objectionable perspective distortions experienced in stereoscopic viewing will be reduced. The elimination of dark picture surrounds is highly consistent with the realistic effect of stereoscopic viewing.

9. Stereophonic sound in theaters giving positional sound effects in space can hardly be conceivable in home television sound.

The foregoing suggestions for improve-

(Continued on page 29)

† J. Soc. Mot. Pict. & Tv Eng. for Jan., 1951, p. 39.

Safety Film Identification

(Continued from preceding page)

for example, for identifying markings on clothing in laundries.

CAUTION: A word of warning is in order in the case of laboratories using sensitized photographic materials because ultraviolet lamp bulbs contain mercury. If broken, care must be taken not to carry or track mercury into rooms where undeveloped film is stored or handled. Even slight traces of mercury produce sensitized spots on film which become black when developed.

It should also be pointed out that the above method of examination is intended for processed film only and that if used in the inspection of raw stock, fogging of the latter will result.

Fluorescent-treated film base is now being used for 35-mm Eastman Safety Motion Picture Positive stock (type 5302) and will be used for all 35-mm Eastman safety motion picture film without exception as soon as possible—it is hoped, in the early part of 1951.

IN THE SPOTLIGHT

By *HARRY SHERMAN*

WIDESPREAD craft interest in benefit and welfare plans, with many IA Locals now pondering the best manner of approach to suit their particular situations, prompts the publication here of the details of a plan which we have mentioned favorably previously (IP for March, 1949). We refer to the wage dividend which Eastman Kodak Company has paid to its employes for 39 consecutive years, with this year's payment of $18 million going to about 45,000 employes throughout the United States.

Very significant, we think, is the Kodak statement that the plan "was started and continued in recognition of the part its men and women play in the success of the company." The wage dividend, which is paid in addition to regular wages and has no effect upon wage rates, is only one part of a broad program which includes sickness payments, life insurance, disability benefits, retirement annuities, and many special services.

Based on Company Earnings

The dividend is based on the cash dividends declared on the common stock during the year and on individual earnings over a five-year period. Eligible persons receive $27.50 for each $1000 earned at Kodak during the five years 1946 through 1950. Persons with Kodak five years at the end of 1950 receive dividend checks of about seven times their average weekly wages during the five-year period.

However, all employes who started on or before October 1, 1950, and who were at work on the last day of last year, will receive the dividend. Those who joined Kodak after October 1 last, but before January 1 of this year, will receive it if they are at work on the day of payment. Temporary absence on the qualification date does not affect eligibility.

Under the Kodak plan, for each 20 cents by which the cash dividends declared on the common stock exceed 70 cents, the wage dividend rate is ½ of 1% (.005) of all earnings within the five calendar years preceding the date of payment.

Since total cash dividends declared on the common stock during 1950 amounted to $1.80, here is how the formula works: $1.80 minus 70 equals $1.10. Dividing this by 20 cents gives 5.5. Multiply 5.5 by .005 to obtain the wage dividend rate of 2¾%.

Enlightened Business Management

To determine the individual's wage dividend, his earnings during 1946-1950, are multiplied by the 1950 wage dividend rate of 2¾%.

That's how Kodak does it; and it is an outstanding example of social consciousness on the part of enlightened business management.

• Failing to conclude a satisfactory contract renewal with the owner of the Majestic and Allen Theaters in Lima, Ohio, Local 349 pulled its men and picketed the theaters. After five weeks of picketing the strike was finally settled when the wife of one of the striking projectionists bought the Majestic and immediately signed a new contract with the Local calling for a wage increase of 15c per hour.

• The New York City Board of Education recently elected Morris J. Rotker, member of Local 306, to the chairmanship of the School Board for the Borough of the Bronx. Morris is a past president of the 25-30 Club, and his new appointment comes as no surprise to his many friends who know of his deep interest in civic matters.

• The members and officers of IA Locals 78 and 236, Birmingham, Ala., were commended by the Birmingham Civil Defense for donating their services to the presentation "If an 'A' Bomb Falls," which was shown there under the auspices of the U. S. Army and the U. S. Air Force Recruiting Service in cooperation with the Birmingham organization. The first showing of this sketch was made at the Temple Theater on January 25 last, and so great was the demand for tickets that it had to be shown again at the Municipal Auditorium on Febru-

DICK GREEN, MEMBER OF LOCAL 165, HOLLYWOOD, CALIF., HONORED AT DINNER

Hollywood Local 165 presented Dick Green, former IA official and popular member of the Local, with a gold life membership card at a dinner party tendered at the Riviera Country Club in Los Angeles on February 21 last. The dinner was held at the close of the annual meeting of Calif. District Council No. 2, and was attended by 93 delegates from Southern Calif. IA Locals.

Shown in the picture above (left to right) are: Howard Edgar, sec., Hollywood L. 165; Floyd Billingsley, 3rd IA vice-pres., and bus. rep., San Francisco L. 162; Steve Newman, IA rep.; Carl Cooper, 7th IA vice-pres., and bus. rep., Los Angeles L. 33; Ed Eagan, pres., L. 165; Dick Green; Billy Wise, bus. rep., San Diego L. 297 and pres. Calif. Dis. Council; Lon Bennett, sec., Long Beach L. 521, and sec. Calif. Dis. Council; Roy Brewer, IA rep., and Zeal Fairbanks.

LOCAL 384, HUDSON COUNTY, N. J., OFFICIALS UNANIMOUSLY REELECTED

Reelected to office by acclamation is the proud distinction of the official family of Hudson County Local 384. Shown here are the officers as they were obligated at the regular February meeting: (left to right) Frank Maurus, exec. board; James Saponar, sgt.-at-arms; John Cantoli, sec.-treas.; Frank Mandrake, who is rounding out his 21st year as president of the Local; Albert De Titta, exec. board; Ralph DeMeo, bus. rep., and Ira Dulberger, cor.-rec. sec. George Wedemeyer, vice-pres., and Charles May, exec. board member, were not present on account of illness.

ary 22. The services of the two IA Birmingham Locals were donated at each performance.

• The recent death of Leon Lonis, member of Local 228, Toledo, Ohio, ended the career of one of the Local's oldest and most active members. Lonis joined the Local in April, 1914, and for the past 30 years worked in the projection room of the Royal Theater. He is survived by his wife, Lyda, and a sister.

• A dinner party marked the recent 40th anniversary celebration of Local 188, Kalamazoo, Mich. A goodly crowd turned out to celebrate the event, which was held at Louie's, a popular restaurant in Kalamazoo. Leeman J. McCarty, secretary, provided one of the highlights of the evening when he ran off several reels of movies taken about 20 years ago of past and present members of the Local. Another was the presentation of gold life membership cards to charter members Harry Miller and George Heath, members of the Local for the past 40 years.

• A recent ruling by the NLRB of Washington, D. C., held that the so-called "featherbedding" ban of the Taft-Hartley Act does not prohibit unions from seeking actual employment for members, even though the employer involved ". . . does not want or need such services and is not willing to accept them." This ruling applied specifically to the case involving the Palace Theater in Akron, Ohio, and Local 24 of the Musicians' Union, AF of L (IP for June, 1950, p. 20). The union demanded that the theater employ a standby orchestra to play a certain number of separate engagements as a condition to the Local giving its consent for traveling name bands to play at the theater. In accordance with the majority ruling of the Board, the complaint against the union was dismissed.

• Tucson Local 415 celebrated its 25th anniversary with a breakfast at the Santa Rita Hotel coincidental with the February mid-winter meeting of the IA Executive Board. IA President Walsh, who presided at the Board meeting, was the guest of honor at Local 415's breakfast party and made several presentations on behalf of the Local. W. P. Raoul, IA secretary-treasurer, Mayor J. O. Niemann, and a number of Tucson's civic and labor leaders were among the invited guests.

• A note from Richard Salamone, business representative for Local 723, Norwood, Mass., advises us that Andrew E. Grigun, the Local's popular secretary, became the father of a baby girl. Congratulations, pop.

• California District Council No. 2 held its annual meeting February 20 last at the Riviera Country Club in Brentwood, a suburb of Los Angeles, with the usual large turnout. The delegates witnessed a demonstration of the RCA large-screen Tv, which was put on by the management and projection crew of the Orpheum Theater in L. A. While they all spoke very favorably of the demonstration, they considered the cost of $40,000 for the installation of the equipment to be a serious drawback to its widespread use in theaters. (Since then this has been reduced to $15,800, according to a recent RCA announcement.)

Many of the delegates reported new contracts calling for cost-of-living increases.

Hollywood Local 165 tendered an excellent dinner to the delegates and guests, a feature of which was the presentation of a gold life membership card to one of its outstanding members, Dick Green, former IA secretary-treasurer. Merle Chamberlain and Walter McCormick, of the Hollywood Local, were in charge of entertainment arrangements.

• The recent death of Edward C. Siegfried, charter member of St. Louis Local 143, removes from its roster one of the few remaining old-timers. Survivors are his wife and a daughter.

Other Local 143 charter members are

MISSOURI STATE ASSOCIATION HOLDS ITS ANNUAL MEETING AT JOPLIN, MO.

Delegates and visitors to the Missouri State Association Convention pose on the steps of the Connor Hotel in Joplin, Mo., where the meeting was held on January 23 last. In addition to the delegates from the IA Locals in Missouri, representatives from the National Theatre Supply Co., Altec Service Corp., and RCA were in attendance. Felix D. Snow, 6th IA vice-president, may be seen in the front row, fifth from the left.

LOCAL 188 HONORS CHARTER MEMBERS

Harold Sargent (right), vice-president of Local 188, Kalamazoo, Mich., presents gold life membership cards to Harry Miller and George Heath, charter members of the Local.

A. P. Petill, Geo. O'Rafferty, and F. W. Kessler.

• We were sorry to learn that Roy Cogdill, former business representative for San Antonio, Local 407, is hospitalized. We hope his recovery will be a speedy one. Roy did a swell job in settling the long drawn-out strike of the Local against the Saragoza Amusement Co.

• It does our old heart good to get a letter from one of the smaller IA Local Unions telling us how they improved working conditions for their members. Such a letter is the one we received recently from V. (Dip) Vaught, president of Local 328, Pine Bluff, Ark.

Although the projection room of the theater where Dip has been working for the past 26 years has proper sanitary and ventilating facilities, he spent considerable time and effort in trying to get all the other theater owners in the Local's jurisdiction to make the same provisions in their theaters. Failing this he contacted the mayor of his city, who brushed him off to the Health Department.

The director of the Health Department passed him on to one of his underlings, who, in turn, stated that he would take the matter up with the State Health Department. Not hearing from the State Health Department within a reasonable period of time, Dip communicated with the director of the State Labor Department, who, incidentally, happens to be a good friend of his. This seemed to do the trick, for within the next few days a representative from the State Health Department got in touch with Dip and immediately thereafter a careful check was made of sanitary and ventilating facilities in all the theaters. Recommendations were made to the delinquent theater owners, who lost no time in acting on them.

While it is true that Pine Bluff had no laws at the time which would have forced the theater owners to make the necessary improvements, the latter were aware of the fact that no time would be lost in remedying the situation, and that if legal steps had to be taken to *force* them to act on the recommendations, they probably would find it pretty costly.

Now, writes Dip, all theaters in Pine Bluff, including the drive-ins that are located outside the city limits, are equipped with toilets, wash basins, and are properly ventilated.

Local 328 also enjoys a share-the-profit plan with various exhibitors, in addition to wage increases of 7½%, and two-week vacations with pay, which were granted with the signing of new contracts in January of this year. We know of larger IA Locals that cannot match these conditions.

WALTER BURROWS AWARDED LIFE MEMBERSHIP CARD IN TUCSON LOCAL 415

One of the highlights of the recent 25th anniversary breakfast of Tucson Local 415 was the presentation by IA President Richard Walsh of 25-year emblems to six members of the Local, one of whom, Walter Burrows, secretary, also received a paid-up life membership card. Walsh, third from right, is shown presenting the card to Burrows. Looking on are Wm. P. Raoul, IA secretary-treasurer (extreme left), and the five members who received the 25-year emblems (left to right): Gonzales E. Martinez, Wm. H. Witt, Albert Runkle, A. J. Denny, and Richard Yrigoyen.

IA ELECTIONS

LOCAL 188, KALAMAZOO, MICH.

John Brill, *pres.;* Harold Sargent, *vice-pres.;* Leeman J. McCarty, *sec.;* Howard Woods, *treas.;* Arlo Slentz, *bus. rep.*

LOCAL 204, LITTLE ROCK, ARK.

Jack Schoemaker, *pres.;* Robert Baldridge, *vice-pres.;* Paynter Rochelle, *rec. cor.-sec.;* Guy Myers, Jr., *fin.-sec.;* Guy Redmond, *treas.;* Ira Baldridge, *bus. rep.;* Leonard Thalmueller, *trustee;* Charles Cates, *sgt.-at-arms.*

LOCAL 224, WASHINGTON, D. C.

Charles Franks, *pres.;* Charles Fischer, 1*st vice-pres.;* Milton Bittenbender, 2*nd vice-pres.;* T. DeWitt Bittenbender, 3*rd vice-pres.;* Willard Garcia, 4*th vice-pres.;* Alfred Mueller, *sec.;* T. LeRoy Hopkins, *fin.-sec.;* Carl Fowler, *treas.;* Ralph Grimes, *bus. rep.*

LOCAL 343, OMAHA, NEBR.

Alvin Kostlan, *pres.;* R. L. McIntyre, 1*st vice-pres.;* Art Krake, 2*nd vice-pres.;* Clyde Cooley, *corr.-sec.;* R. V. Mortenson, *fin.-sec.;* Ross Hatton, *treas.;* Howard Jackson, *bus. rep.;* R. L. Harrington, Mace Brown, P. W. Pollard, *trustees;* Al Frazier, *sgt.-at-arms.*

LOCAL 384, HUDSON COUNTY, N. J.

Frank Mandrake, *pres.;* George Wedemeyer, *vice-pres.;* Ira Dulberger, *cor. rec.-sec.;* John Cantoli, *sec.-treas.;* Ralph DeMea, *bus. rep.;* Frank Maurus, Albert De Titta, Charles May, *exec. board;* James Saponar, *sgt.-at-arms.*

LOCAL 444, NEW KENSINGTON, PENNA.

Phil (Blackie) Bordonaro, *pres.;* Walter Austin, *vice-pres.;* F. P. (Reel) McCoy, *sec.;* Charles Wolfe, *treas.;* J. J. McCloskey, *bus. rep.;* Ralph Milberger, Joseph Mikelic, H. L. Wolfe, *trustees;* Clyde Johnson, Bernie Zamperini, Joe Kaduk, Joseph Milburn, *exec. board;* Anthony Hacznak, *sgt.-at-arms.*

CALIFORNIA DISTRICT COUNCIL NO. 2

William Wise (San Diego L. 297), *pres.;* Ralph Adams (Santa Ana L. 504), *vice-pres.;* Alonzo S. Bennett (Long Beach L. 521), *sec.-treas.;* John H. Gotchell (Santa Barbara L. 442), Harry E. Reynolds (San Bernardino L. 577), Art Narath (Santa Ana L. 504), *trustees;* G. A. Lahlum (Long Beach L. 521), *sgt.-at-arms.*

National Theatre Supply Meet

New products and services to be offered to exhibitors in 1951 was the keynote of the first of a series of district sales meetings of National Theatre Supply representatives held at Hotel Hollenden, Cleveland, February 8th and 9th.

Sales personnel attending included managers and salesmen from Indianapolis, Cleveland, Detroit, Cincinnati, Buffalo and Pittsburgh branches. From the company's executive offices in New York were W. E. Green, President; J. W. Servies, District Supervisor; W. J. Turnbull, Sales Promotion Manager; and J. E. Currie, Drive-In Theatre Department Manager.

The Cathode-Ray Tube: Basic Data

By JOHN F. RIDER and SEYMOUR D. USLAN

This is the third and final article of a series* anent the principles of electrostatic action which governs the operation of the cathode-ray tube. These data appeared originally in *Encyclopedia on Cathode-Ray Oscilloscopes and Their Uses* and are published here by permission of John F. Rider, publisher of this authoritative 982-page book.**

FIGURE 7 shows a pattern of the electrostatic field between two like charges. Whether they are two positive or two negative charges is immaterial; we show two of the latter simply as a matter of choice. If they were two positive charges, the field still would be the same.

Let us examine this field pattern somewhat critically. The first condition we note is that there seem to be no termination for the lines of force. Why not? The answer is simply that we show only a portion of the fields associated with these two like charges. In reality, each of these two like charges has its own field point. It is to these unlike charges that the lines of force shown in the figure continue. In other words, when we show the field between two like charges, we really are showing only that section of each of two fields, extending between two unlike charges, which is in the proximity of the two like charges.

It is conceivable, in theory, to visualize these two like charges isolated in space, each with its field extending to infinity, and to describe a direction for each line of force according to its effect upon a "test" electron (one which is placed in the field for determination of lines of force). In accordance with this idea, the directions of the lines of force which face each other would be the same.

However, the reason for tying in the two like charges under consideration with two other charges of opposite sign is that it permits the closest correlation with what is to follow. Fig. 8 is the drawing we shall use for discussion from this point on; this is the same, in substance, as Fig. 7, with the addition of the "remote" charges.

Repulsion Between Like Charges

A few differences exist between the two drawings, but in the main these are due to perspective, rather than to any actual difference in conditions. What we have done is to reorient ourselves relative to the imaginary lines of force. The fact that we illustrate two pairs of like charges instead of a single pair does not complicate the discussion. Whether it is a single pair of like charges or two pairs, the question remains the same: "What is the basis of the repulsion between like charges?"

Remembering that the attraction between unlike charges is attributable to the contracting properties of the lines of force, it is not too far-fetched to suppose that the repulsion likewise is due to some action on the part of the lines of force.

This is the case: it is the lateral repulsion between lines of force having like direction, which is responsible for the repulsion between charges. As is evident in Fig. 8, the direction of the lines of force facing each other and which join the two pairs of unlike charges is the same; these lines feel repulsive forces between them. Being attached to the lines, the charges likewise feel the same forces and move apart.

It is necessary to understand that the repulsion between similarly directed lines of force does not depend upon motion of the charges. In fact it is the reverse: the motion of the charges is due to the repulsive forces. These exist even if motion of the charges responsible for the fixed field cannot take place because of the nature of the system.

Change in Configuration

Relative to the pattern of the field shown in Fig. 8, another significant condition must be mentioned. This, the flattening of the facing lines of force as the consequence of the repulsion between them. While this may not have a great meaning with respect to the actural action, the change in the configuration of the lines of force so that they run almost parallel to each other is a very important point.

At this stage, you may be wondering about the connection between the field as shown in Fig. 8 and what happens in the cathode-ray tube. The justification for showing the relationship between like charges is twofold. First, the type of configuration of the facing lines of force in Fig. 8 is a very close approach to what will be found in the cathode-ray-tube electrostatic focusing system. The second reason is to explain the background of the action whereby an electron moves away from a negatively-charged body. This could not be done very well using the field between two unlike charges.

On the whole, the field patterns in Figs. 5* and 8 serve well as background for the field patterns which will be found not only in the electrostatic focusing systems but also in the deflection systems.

Action of Charged Bodies

Expanding upon the basic conditions which we have described, it stands to reason that if a body or a surface is made to bear a preponderance of a charge of a single sign, that body will, in principle, display the same electrical effects as a single charge of the same sign. Of course, the magnitude of the effect will naturally be much greater, because there are many more charges present.

Therefore, if we arrange one surface to bear a preponderance of electrons and another to bear a preponderance of positive charges, and these two surfaces are placed so as to face each other, but are

* The first installment appeared in IP for Dec., 1950, p. 28.
** 480 Canal St., New York 13, N. Y.

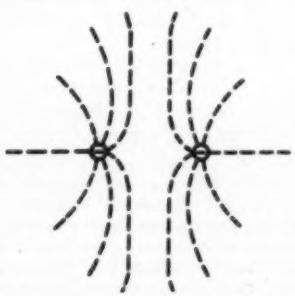


FIG. 7. Electrostatic field between two like charges.

* IP for Feb., 1951, p. 25.

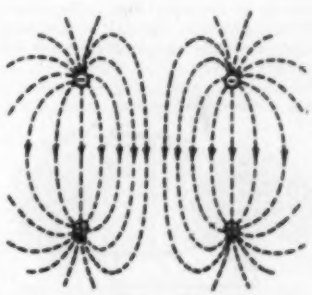


FIG. 8. Combined electrostatic field between like and unlike charges.

separated, an electrostatic field will exist between the two charged surfaces. The space between the surfaces will be filled with lines of force which will have a certain direction.

Such a system is shown in Fig. 9. The voltage source *B*, with an arbitrary difference of potential between its terminals, is connected to two parallel metal plates *A* and *C*. Prior to the application of the voltage, a condition of electrical equilibrium existed on the two plates; equal numbers of unlike charges resided on each of the plates, therefore, the space between the plates are devoid of any field.

When the voltage is applied, this two-plate "condenser," with air separation between, becomes "charged" like any ordinary electrical capacitor would.

One of the plates, *A*, bears a preponderance of positive charges and the other plate, *C*, bears a preponderance of negative charges by virtue of the polarity of the charging source; an electrostatic field is created between the plates and the space is filled with lines of force. In view of what was said earlier, we need not comment on the origin of the lines of force; if anything deserves comment, it is the configuration of this field as compared to the field between two unlike charges as previously illustrated.

Uniformity of Field

Between the plates, the field is made up of lines of force which are straight, and we may assume that they are uniformly distributed within the boundaries of the plates because the separation between the plates is small compared to the other dimensions of the surface.

If we neglect the conditions near the borders of the two plates, the number of lines of force penetrating any unit area of surface on the plates will be the same everywhere on the plate. Such a distribution of lines of force constitute a *uniform field;* this condition would not hold if the plates were not parallel.

As to why the lines of force which join the charges on the two plates are straight, rather than both straight and curved as shown in Fig. 5, that too is simple to explain. To begin with, charges made to reside upon a flat surface will normally distribute themselves uniformly over the surface. With large numbers of charges residing on each of the plates, there are many lines of force. Each of these, with the exception of the fringe at the boundaries of the plates, feels equal to repulsive forces all around it. With forces of equal magnitude tending to repel each line from all directions, the balancing of these forces leaves the line straight.

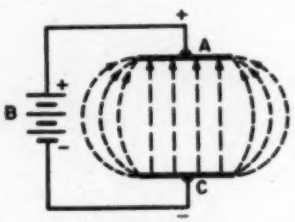


FIG. 9. Electrostatic field between two charged plates.

The curvature of the lines of force at the borders already has been explained in discussing the two charges of Fig. 5. These lines curve outward because the repelling force issuing from the area between the two plates exceeds the force which stems from the area on the outside of the lines. The result is outward curving lines of force. This non-uniform fringe field usually can be neglected.

Regarding the direction of the field, we follow the previous convention, namely, that direction as would be defined by its action upon an electron. Therefore, the line of force points away from the negatively-charged plate and toward the positively-charged plate.

Energy of the Field

Several very interesting and important observations can be made about such an electrostatic field. First, the creation of it requires work, or energy, because the separation of negative charges from positive charges is accomplished only by the application of some force. Moreover, as more and more electrons are removed, the attractive force of the remaining charges upon the electrons becomes greater and greater.

In like manner, the accumulation of electrons on the other plate also becomes increasingly difficult, since like charges repel; therefore, force must be exerted to push these negative charges onto the so-called negative plate. As more and more electrons are piled onto this plate, the repulsive force naturally increases and must be overcome in order to push more electrons onto that surface. In short, *work must be done upon these electrons in order to get them to redistribute themselves in this manner.*

Bearing in mind that these electrons were initially at rest, some source must impart energy to them so as to cause them to move around through the circuit in a specific manner and specific direction—against the natural forces which either bind them to each other or tend to make them repel each other, depending upon the polarity of the charges.

Source of Energy

This function of supplying energy to the electrons is performed by the device which "charges" the system. In Fig. 9 this is the battery *B* which can be replaced by a voltage source of some other type, such as a vacuum tube or a generator, without altering the basic phenomena. The voltage source introduces the initial *difference of potential* or *electromotive force* (emf), which exists between its terminals, necessary to make the electrons move around the circuit.

As the negative charges are transferred from one plate to the other, they convey energy and gradually establish a corresponding difference of potential between the plates themselves. The energy which the voltage supply imparted to the electron is transferred to the electrostatic field (between the plates) when the electron comes to rest. Therefore, we can view the difference of potential between the two parallel facing surfaces as representing the capabilities of the electrostatic field to make electrons move, just as the initial difference of potential between the terminals of the voltage source enabled electrons to move through the system initially.

The electrostatic field between the plates can make electrons move either between the plates, or through a conductor which joins the two plates. The limit of movement of the negative charges under the influence of the original voltage source is reached when the difference of potential established between the plates equal the difference of potential between the terminals of the battery. At this time, the magnitude of the attractive force of the positive charges on the positive plate and the magnitude of re-

(*Continued on page* 26)

No Carbon Shortage in Sight Says National Carbon Co.

There is no carbon shortage in sight, according to National Carbon Co., in a statement directed at counteracting the ill effects of a news release appearing in the motion picture trade press under the dateline of March 2. This release called attention to a shortage of monazite sand as a raw material essential in the production of projector carbons, spotlamps and other equipment used in the motion picture industry.

National Carbon Co., quick to realize the trade disturbances that might be caused by such reports, states that in its opinion there will be an adequate supply of carbons in the foreseeable future, and that, as a consequence, there is no need for theaters and suppliers to overstock.

Last December, at the time of the issuance of copper conservation order M-12, National Carbon announced that an adequate supply of carbons was assured. Despite current reports at variance with this estimate, National Carbon sees no need for any change in its outlook.

From the Production Front

Variable Shutters in 16-mm Filming

By JOHN FORBES

PERHAPS the least understood feature of the cine camera is the shutter. How it functions, what its effect is on the exposure, and the comparative results to be obtained with shutters of various size openings is something that is rarely considered by the novice cinefilmer. But to the advanced 16-mm movie maker all this is quite important, even though his camera may only feature a shutter of the fixed type.

Briefly, when we expose a frame of cine film, the film is held motionless in the camera for a fraction of a second. Before the next frame can be exposed, the film must be advanced in the gate in order to bring an unexposed frame in place for the next exposure. During this advance of the film, the light coming through the lens must be cut off momentarily, and this is the function of the shutter.

Rotary Disc Type Shutter

In most 16-mm cameras the shutter is of the rotary disc type. Part of the disc is cut away to permit the passage of light to the film for the exposure. The disc shutter rotates continuously as the camera is operated.

Obviously, the larger the opening of the shutter, the more light reaches each frame of film and, consequently, the greater is the period of exposure. But there are some definitely limiting factors. Most important of these is the mechanical problem of moving the film.

During the period between the exposure of two successive frames (that is, the time period during which the shutter is "closed"), the film must be started, moved—then stopped dead. Clearly, if the open part of the shutter is large, the film must accelerate, move and decelerate very quickly. If the open sector of the shutter is smaller, the film can be moved more slowly and, accordingly, more gently. But we pay for this less strenuous movement by getting less light for the exposure.

Varying Exposure Times

What has all this to do with ordinary camerawork, you may ask, remembering, of course, that changing speeds and shutter openings are possible only with a few cine cameras. Well, to explain further, suppose we have an ordinary still camera and the established exposure for a given shot is F:8 at 1/25 second. If we shorten the exposure time to 1/50 second, we will have to open up the lens a corresponding amount—to F:5.6—in order to secure the same exposure.

It's the same in cine camera work. Suppose we are using one of the popular cine cameras which has a shutter opening of 204°. This gives an exposure interval of 1/27 second at 16 frames per second. If we shoot a scene with this camera and find that F:8 is the right stop to use, the resultant exposure will be different from what another cine photographer would secure with a camera having a smaller shutter opening.

Let's say the other photographer's camera has a shutter giving a 1/48-second exposure. If he is to match our exposure on the scene, he will have to shoot it at F:6.7 (or lens stop nearest this figure, *i.e.* F:6.3). If we, with our 1/27-second shutter, are shooting at F:2.5, the other filmer will have to open up to F/1.9 to get comparable results; and if we are shooting at F:1.9, the other fellow with the faster shutter (giving less exposure per interval) won't be able to shoot the scene successfully at all, for he would have to use a lens opening of F:1.1 to match our exposure.

Greater Depth of Focus

Another point to consider is that by using the smaller lens stop, the lens will have much greater depth of focus than would the lens on a camera with a smaller shutter opening; and this difference would be increasingly noticeable as the lens was opened wider or focused on nearer objects, as for closeups.

On the other hand, in the matter of getting clear pictures of fast-moving objects, the camera with the smaller shutter opening offers a distinct advantage. It affords a shorter exposure interval, and this in turn means that fast-moving objects will have less time to move during an exposure, and consequently less blur will result.

Adjust for Every Shot

Obviously, the solution to the shutter problem for the advanced amateur's cine camera is the adjustable shutter, same as found on standard 35-mm motion picture cameras. This would permit adjusting the shutter opening to suit the shot. All professional 35-mm cameras used in the studios have variable shutters, and most of them allow adjusting the shutter opening while the camera is running, if necessary. This has proven a very valuable adjunct in shooting scenes where the camera moves in and out of dark areas, or for trick effects where speed of a person or an object is to be altered without stopping the camera.

Of the 16-mm cine cameras in popular use today, two are provided with variable shutters, adjusted manually by the operator—the Eastman Cine-Kodak Special and the Pathe "Super 16." This feature has been used mainly for making fades and lap dissolves, but it presents other cinematic possibilities also.

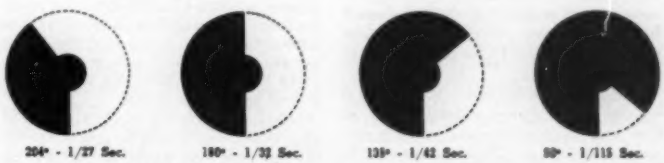
Here are some of the ways 16-mm cinefilmers may benefit their cinematography by varying the shutter opening—ways that the professional cinematographer long ago employed to improve the quality of his camera work:

Fades and Lap-Dissolves

Most obvious, of course, is the making of fades and lap-dissolves. This in itself justifies the variable shutter as standard equipment on the advanced amateur's cine camera.

Next, and much more important, is the control of exposure without altering lens setting. Remember, reducing the lens opening increases depth of focus, and increasing the aperture size reduces depth. Such changes between closely related scenes are not pleasing; and when light fluctuations, such as a cloud passing over the sun, for example, make such changes necessary within a scene, they are doubly objectionable. By controlling the light with the shutter, such depth of focus contrasts can be avoided.

If, for instance, we refer to the chart on page 144 of the new 1950 edition of the *American Cinematographer Handbook*, we see that if we are shooting on one of those days, say, when small clouds are obscuring the sun, we can set our lens at, say, F:8.3 and the shutter at 90° and get the same exposure as though we shot at F:11.3 with the shutter opened to 170°. With cameras having a variable shutter, when a cloud suddenly appears to reduce the light falling on the scene, the exposure can be kept uniform (in



Relative exposure intervals afforded by camera shutters of various size. The smaller the shutter opening, the faster the shutter "speed," with greater ability to "stop" action.

relation to preceding shots) by simply opening the shutter to a wider aperture. If the clouded light would be a normal F:8.3, all we need to do is open the shutter to 170° and we get the effect of increasing the exposure to the proper value without changing quality of our picture.

The same procedure may be followed in panoraming and in making moving camera (follow) shots. Suppose we are following a person with the camera, walking from bright sunlight into heavy shade. Let's say there is a good three-stops difference in the exposures between the lightest and darkest areas of the scene. We can begin the sunlit end of the shot with the camera lens open three stops wider than normal — say, F:5.6—and the shutter closed down to about 50°. As our subject moves into the shade, the shutter is opened up to an aperture of 170°.

Uniform Exposure, Quality

Throughout the shot, both exposure and quality of picture will be uniform, for we offset the changing light by increasing exposure time from 1/115 to 1/34 second. The same expedient will also prove useful in super-speed "slow-motion" shots, as well as in making undercranked fast-action scenes.

Finally, the controllable (variable) shutter will prove its worth in scenes of fast moving action. By reducing size of the shutter aperture, exposure time is cut, resulting in crisp, blurless pictures.

The appended communication from a recognized authority in his field is noteworthy in view of the repeated assurances by the manufacturers of film cements that they do not use dioxane in their preparations.—Ed.

To the Editor of IP:

I am afraid our efforts have been of very little avail in giving you any real answers to your questions. First . . . we do not know anything of practices of the trade in this respect, nor de we know of any observations that have been made that would indicate the nature of the solvents used, the concentration of dioxane therein, and the concentration of dioxane and/or other solvents vapors in the atmosphere of projection rooms. In the absence of such information, anything . . . said on the subject is pure guesswork. Therefore . . . before anybody says anything about this subject pro or con, some observations that would establish the facts should be made. It is entirely conceivable that there are dangers, and therefore the situation merits investigation.

Wide Variance of Opinion

With specific reference to the toxicity of dioxane and the probable effects, there is some disagreement. Yant and his associates concluded from their experiments that dioxane had a low order of toxicity, and pointed out that men could be exposed to air containing 1000 parts per million of the vapor of this solvent without discomfort.

The latter does not mean, however, that persons exposed over a long period of time to low concentrations will not suffer some injury. Without necessarily contradicting the observations and opinions of Yant, other observers have described effects which they believe to be those of insidious, more or less chronic, effects, associated with prolonged exposure.

The toxicity of the material in low concentration in the atmosphere has not been investigated sufficiently to enable one to establish soundly a differentiation between safe and unsafe concentrations in the air. Various states, acting on information available at the time of their adoptions of a standard, have set standards which vary all the way from 1000 parts per million to 100 parts per million. Aside from governmental agencies, I know of no body of professional men that has adopted a standard, other than the American Conference of Governmental Hygienists.

'Allowable' Concentrations

This group, of course, is made up largely of men representing official agencies. They have adopted the maximum allowable concentration of 100 parts per million. This standard was based on a number of considerations, and, from present information available, it would seem that if it is in error it errs on the safe side.

So far as we know, there are no standard methods at present for the determination of the concentration of dioxane in the air. Two or three methods have been suggested, but we do not know whether determinations have been made, or if so, what methods have been used for this purpose in industrial establishments.

Conclusive Evidence Lacking

If I were going to take a position as an editor on this subject, I would want better evidence than any I have given you in this letter, or any that are available to us at this time It would seem that the facts could be established by the examination of the conditions under which men work, and also by the examination of the men so exposed. I have no wish or intention of condoning conditions that are unsatisfactory, but I cannot but feel that there is no substitute for facts as a basis for expressing an opinion on this subject.

ROBERT A. KEHOE, M.D.
Dept. of Preventive Medicine and Industrial Health, University of Cincinnati.

IA-IP Amateur Radio Contest Data Deferred for a Month

Publication of the outcome of the recent IA-IP amateur radio contest, scheduled for this issue, will have to be deferred for another month due to the unfortunate circumstance which occasioned the loss of the final tally in transit from Amos Kanaga in California. It was hoped right up to the last minute that a new tally could be prepared in time, but inevitably the deadline arrived and had to be met.

Fortunately, Amos retained his original work sheets, thus he will be able to replace the lost data. He promises faithfully to have them on tap in ample time for the next issue of IP.

Projection Tidbits From the Foreign Field

Herewith are several interesting items culled from the foreign film trade press. From *Sight and Sound*, Australia: The manager of a surburban theater pleaded guilty to a breach of the Cinematograph Regulations in that he had employed regularly each day a projectionist who was licensed to operate only as an "assistant" two nights each week.

In imposing a fine of $50 on the manager, the judge commented: "The regulations are specific, and the obligation is on the employer to see that the projectionist is properly licensed. The important factor here is that public safety is involved."

A Projectionist's Prerogative

In the same journal is the account of how a projectionist ran a Technicolor print for one night only and then refused to run it thereafter on the ground that it was "unsuitable for exhibition" because of its poor physical condition. The second evening's show was cancelled and admissions were refunded. The projectionist was upheld by both his Union and by the law covering motion picture exhibitions, which provides that the projectionist may, when he deems fit, refuse to run any print which he considers in poor physical condition.

In *Ideal Kinema*, of London, editor R. H. Cricks offers this item: A Cinecolor

print marked SAFETY FILM contained about 50 splices, several of which were remade with non-flam cement. After the first showing all remake splices came apart. All splices were then remade with nitrate-film cement, and gave no further trouble. A test with a lighted match disclosed that the film stock was nitrate. The distributor reported that the film was *not* safety stock, as the words SAFETY FILM were not printed in black lettering.

Laboratory is Held at Fault

Comments editor Cricks: "A test with a match confirms that the stock is not safety—anyway, the edge-printing of all film stocks is, of course, in black lettering, not white-on-black. It is clear that one of the two negatives from which this copy was printed—the blue printer—was on safety base, and that in blackening the margin of the positive the words SAFETY FILM have printed through.

"I hasten to add that one should not unduly blame Cinecolor for this fault, for it is a common practice in many laboratories to print the edges of the film in order to print through the edge numbers from the negative. But if safety films are being used for negatives or for laboratory films, it is a practice that must stop."

Warner Bros. Dissolution Terms

Warner stockholders will receive a half share in the new theater company and a half share of the new picture company for each share of Warner stock held of record when the reorganization becomes effective on or before April 4, 1953.

Assets of the new theater company will include all Warner theater assets in the U. S., represented by investments in and advances to subsidiaries, and sufficient cash and Government securities in order that the consolidated balance sheet of the new theater company and its subsidiaries will reflect a ratio of not less than 1½-to-one of current assets to current liabilities.

Holdings Total 436 Theaters

Warners, through its theater subsidiaries which are more than 99% owned, has 436 theaters consisting of 236 houses owned in fee, 191 leased theaters and nine theaters partly owned and partly leased. Of these, 20 are presently closed, seven are leased or sublet to a 50%-owned subsidiary, and three are leased or sublet to others.

Under the consent judgment, Warners or the new theater company must, within two years, divest itself of 54 theaters, of which half must be divested within one year. Divestiture of up to 27 additional theaters may be required upon the happening of contingencies described in the judgment.

Warner will transfer to the new picture company all production and distribution assets and all other assets not transferred to the new theater company.

1950 Admissions Tax Off 7%

U. S. motion picture theaters grossed an approximate $1,320,000,000 last year, about 7% under the $1,430,000,000 grossed in 1949, it is estimated on the basis of Internal Revenue Bureau reports of admissions tax collections against the 20% levy. IRB reported that its January collections, which reflect December admissions, totaled $26,856,033 for general admissions. Figure compares with $27,909,723 for the same period of last year.

General admissions collections reported for the 12 months of 1950 total $347,390,757, with approximately 76% of this figure estimated to come from film theaters. In 1949, the collections totaled $374,374,696.

RCA Promotes Jack O'Brien

J. F. (Jack) O'Brien has been appointed sales manager of RCA theatre film recording, visual, and sound equipment. In charge of theatre equipment sales since 1946, O'Brien succeeds Barton Kreuzer, promoted recently to manager of the administration division of RCA engineering products. O'Brien with RCA since 1931, when he started as a representative in the company's national credit department, has held important

sales posts for engineering products in Hollywood, Indianapolis, St. Louis, Chicago, and Boston. His activities in theatre equipment sales during the past 20 years have made him nationally known in theatre circles.

O'Brien, a native of Buffalo, N. Y., is a graduate of New York U. He is a member of the Variety Club of America, and has been active in the affairs of such organizations as the SMPTE, TESMA, and the TOA. He resides in Audubon, N. J.

RCA Theater-Tv Price Slash

BIGGEST shot in the arm for theater television since its inception was administered early this month when RCA announced a reduction in price of its PT-100 theater Tv system from $25,000 to $15,800. The former high price tag has encountered terrific exhibitor opposition; although some trade circles viewed the RCA move as an anticipatory counter to expected activity by 20th Century-Fox with the Eidophore (Swiss) large-screen Tv system for which it recently closed a deal.

The reasons for the RCA move at this time are relatively unimportant by comparison with its tremendous implications anent the future of the motion picture theater, with the expansion of the art now lying squarely on Mr. Exhibitor's doorstep. One trade reaction is that 1951 may see the installation of an additional 150 to 200 Tv systems in theaters.

No Parts Shortage at Present

RCA declared that it is proceeding with full-scale production of the PT-100 system, with the "standardized picture tube and other electron tubes and components it employs being readily available" at this time. PT-100 circuits are so designed that a minor adjustment will permit operation with higher picture definition if standards permitting such definition should be adopted for closed-circuit theater Tv.

Most recent proof of the boxoffice draw of the instantaneous theatre television now available, pointed out RCA, was the capacity audience of 4000 which jammed Fabian's Palace Theatre in Albany on Tuesday night, February 20, to see the Sienna College-Georgetown University basketball game being played before an on-the-scene audience of only 2500 in the Uline Arena in Washington, D. C. This attendance was chalked up despite the fact that it was the last night in the run of the feature motion picture currently being shown.

Modify Aluminum Scrap Order

NPA's aluminum scrap order has been amended to postpone the effective date of certain provisions until April 1 in order to permit the inclusion of additional firms to process aluminum scrap. As originally issued, the order (M-22) designated, on the basis of experience and technical resources, certain fabricators and smelters as authorized to process scrap. Since the order was issued, it has developed that the list is incomplete and there are firms not included in the original list who may well be qualified to continue to process scrap.

The order provides that qualified firms will be included, and pending completion of the further review scheduled by April 1, there is no limitation on concerns presently processing scrap. At the same time the

order was also amended to allow foundries, certain types of chemical firms and others to obtain special kinds of scrap for use in the regular course of their operations.

U.S. Exports to India Remain Strong

The preeminent position of the United States in the film export market, despite exchange restrictions, is emphasized by a recent report in India's *Journal of the Film Industry* giving statistics pertaining to import licenses from July through November, 1950. Licenses for film equipment and accessories valued at 1,048,127 rupees were issued, allocated as follows:

Approximately 804,400 was for U. S. equipment, 91,653 for German apparatus, 51,198 for British, 50,438 for Italian, and 50,438 for Swiss. Licenses for raw films valued at 66,775 rupees were issued, *all of it* for British rawstock. Import licenses for motion picture carbons totaled 411,922 rupees, of which 244,519 was for British carbons, 76,659 for United States products, 57,209 for French carbons, and 33,535 for Italian carbons (4.76 rupees equal U. S. $1).

Extract from Committee Report

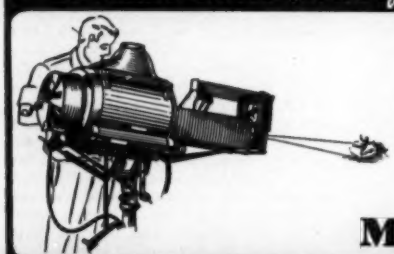
SUMMARY OF PROCEEDINGS
MID-CENTURY CONVENTION
THEATRE OWNERS OF AMERICA, Inc.

"We recommend that you examine your equipment closely and that equipment in which you cannot see at least a three year expectancy of satisfactory service be replaced or repaired. Already there is a growing shortage among certain parts; however, let us not create our own shortages by hoarding."

Where Theatre Modernization Begins!

NATIONAL THEATRE SUPPLY
Division of National • Simplex • Blodgett, Inc.

"World's Most Powerful Spotlight"



The METRO-LITE high-intensity carbon arc spotlight comes in two models:—

★ MODEL ME 4 125 Amps D.C. 100 ft. to 400 ft. throw.

★ MODEL ME 5 "Vaudeville" 60 to 85 Amps D.C. 75 ft. to 250 ft. throw.

METRO-LITE

Literature available on both units upon request to
GENARCO, Inc. 36-56 b 34th St., Long Island City 6, N. Y.

PERSONNEL

ROBERT P. YOUNG has been named manager of professional motion picture sales by Ansco, succeeding J. KNEELAND NUNAN. Young, who joined the company in 1945, will headquarter in Hollywood.

E. T. PICKARD, JR., commercial assistant to the manager of Westrex Corp.'s subsidiary in the Philippines, has returned to New York headquarters for assignment to the radio department of Westrex.

JOSEPH T. GOLAN has been named superintendent of the cine and sheet film division of Eastman Kodak's Rochester plant, succeeding HENRY T. IRELAND, who has retired after 43 years with the company. DAVID A. BABCOCK, superintendent of the Kodak emulsion coating department, retired on March 1 after 45 years of service.

10½ Million Tv Sets Now in U.S.

Total number of Tv sets in the U. S. is now 10,549,500, with a gain of 704,200 sets during last December, reports an NBC survey. Set sales during 1950 totaled 6,000,600, indicating that three out of every five families bought their set during 1950.

Every fourth family in the U. S. now owns a Tv set, states the survey, and two out of five families living in the Tv service area have the set in their homes. New York leads with 2,050,000 Tv *families*, while Chicago has 830,000.

Century Units Into Eastman House

Century 35-mm projectors, water-cooled, and sound system have been installed at George Eastman House in Rochester, N. Y., home of a world-famous collection of historical photographic equipment and data. Incidentally, the projection at G. E. H. is masked with mauve velour.

CATHODE-RAY TUBE DATA

(*Continued from page* 22)

pulsive force of the negative charges on the negative plate are sufficient to offset the electromotive force (emf) represented by the difference of potential, or voltage, of the battery.

Build-Up of Potential

The time required for the difference of potential between plates *A* and *C* to rise to the value of the voltage source *B* is a variable depending upon several factors. None of these are of interest in connection with the systems used in cathode-ray tubes, whose operation is now being explained.

Practically, we can assume an instantaneous rise in potential, between the plates, to that of the voltage source *B*. Of course, there always will be some

time lag, but this is so slight from the usual practical viewpoint that it can be neglected over any range of frequencies presently encountered in cathode-ray tube applications.

The development of a detectable electrostatic field between the plates, or the setting up of lines of force between the plates, commences with the first electron which is transported, and the field becomes increasingly stronger (greater number of lines of force) as more and more electrons are removed from the positive plate and added to the negative plate.

The ability of the electrons, accumulated on the negative plate, to hurdle the gap separating the plates is strictly a function of the intensity of the field; this, in turn, is a function of the amount of energy which is given the electrons by the so-called "charging" voltage source.

If this voltage were gradually increased from zero, a value would be reached when so many electrons had been redistributed that the mutual attraction between the positive charges on one plate and the electrons on the other plate would literally tear away the electrons from the negative surface, in a direction along the lines of force, and a "current" would flash across the gap. This current, or spark, would be momentary of course, but would nevertheless dissipate the entire field.

A phenomenon of this type is an example of *work being done on the electron*, the action being across the space between the plates rather than through any metallic conducting path around the plates. Since it is possible for the field to exert sufficient force upon the electrons on the negative plate so as to pull them to the positive plate, it stands to reason that if electrons were positioned between the plates they could be acted upon in similar manner.

The motion of these space electrons would be governed by the forces present in the field, which in turn would correspond to the field intensity at the point where the electrons were located. This leads to the description of the field from the viewpoint of the forces present at various points in the field.

Forces Acting on Spatial Electrons

Let us use, as the basis of our discussion, the illustration in Fig. 10. This shows a uniform field existing between two parallel plates. We shall locate three electrons, *a*, *b*, and *c*, at three different points in the field. One of them, *a*, will be near the negatively charged plate; electron *b* will be midway between the two charged plates, and electron *c* will be near the positively-charged plate.

All of them will feel the same pull toward the positive plate because of the direction of the field, and, what is more,

The newest projectors can take larger lenses. Here is the lens designed specifically to achieve top performance with these modern projectors — the sensational *four inch diameter* Super Snaplite. Speed of f/1.9 from 5 through 7 inch focal lengths, in ¼ inch steps.

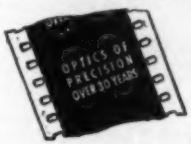
MORE LIGHT...the four inch diameter Super Snaplite gives you an f/1.9 lens in focal lengths as long as 7 inches!

LONG LIFE...one piece mount, specially sealed lens elements, anodized finish that can't flake off — all spell longer, top-notch performance for the four inch diameter Super Snaplite!

SHARPER PICTURES...a true anastigmat lens for longer throws — the four inch diameter Super Snaplite produces pictures wire-sharp right to the very corners!

HIGHER CONTRAST...anti-reflection coatings further enhance the brilliant, crisp, sparkling pictures projected by the four inch diameter Super Snaplite!

Four inch diameter Super Snaplites are available, to order, in focal lengths from five up through seven inches, in quarter inch steps. In all these focal lengths the true effective speed of f/1.9 is maintained. Four inch diameter Super Snaplites are also available, to special order, in focal lengths longer than seven inches, at somewhat slower speeds.



Get the full facts of this superlative new lens now—write for your copy of Bulletin No. 209 today!

"You Get the Most Uniform Light with Super Snaplite"

KOLLMORGEN *Optical* **CORPORATION**
2 Franklin Avenue
Brooklyn 11, New York

all of them will experience the same force making them move to the positive plate. Naturally, all will advance along lines of force.

The movement of the electrons is not due solely to the attraction by the positively charged plate, *A*. A distinct contribution to this action is made by the negatively-charged plate as well. During the time that the positively-charged plate is *attracting* the electron, the negatively-charged plate is *repelling* the electron toward the positive plate. Hence two forces, in the same direction, are acting upon the charge.

If we imagine the electron located midway between the plates, in this case electron *b*, equal forces of attraction and repulsion will move the charge in a single direction, i.e., toward plate *A*. The total force moving the electron will be the sum of these two individual forces, both, you will remember, acting simultaneously in the same direction.

Magnitude of Opposing Forces

If the location of the electron is changed so that it is no longer midway between the plates but near the negatively-charged plate, like electron *a*, the total force acting upon the electron still will be the same as before. Although it is true that the magnitude of attracting force has been decreased due to the greater separation between the charge and the positive plate, the magnitude of the repelling force has been correspondingly increased due to the greater proximity of the electron to the negative plate, thus maintaining the total force constant.

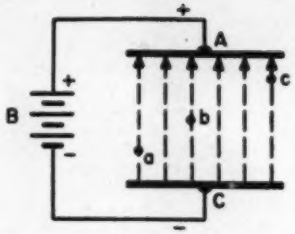


FIG. 10. Electrons placed in electrostatic field between two charged plates and acted upon by force of the field.

Reversing the location of the electron —that is, locating it near the positively charged plate *A*, as in the case of electron *c*—does not change the force acting on the electron. The reduction of repelling force due to the increased separation between the charge and the negatively-charged plate is compensated for by the corresponding increase in attractive force from the closer positively-charged plate.

Thus it is understandable, even without a mathematical analysis, that the electrostatic field acting upon the electron anywhere within such a uniform field is constant. This holds true for any one set of conditions which establish the magnitude of the field and for any one set of plates separated by a fixed distance.

The actual force in dynes experienced by the electron is of no consequence in this discussion. It can be small or it can be great, depending upon the difference of potential between the plates *A* and *C*. The important detail to bear in mind is the direction in which the force acts, and that the force is constant throughout the field.

"ARTIC BLANCH"
Snow White
THE DEPENDABLE SCREEN COATING
for
DRIVE-IN THEATRES
NATIONAL THEATRE SCREEN
REFINISHING CO.
129 ZENNER ST. BUFFALO 11, N. Y.

NOW, more than ever

HOLD your patronage with the

WORLD'S FINEST SCREEN IMAGE!

Replace NOW . . . for steady patronage . . . steady profits . . . with B&L Super Cinephor Lenses

Get large, vivid screen images! They're your best competitive advantage over *any* other type of entertainment. Your patrons will keep coming back to see the sharp, brilliant images of today's fine films . . . the edge-to-edge contrast and definition . . . the superb image quality . . . that you get with B&L lenses.

Write for complete information to Bausch & Lomb Optical Co., 616-3 St. Paul Street, Rochester 2, N.Y.

Bausch & Lomb *Super Cinephor* Projection Lenses

EFFECTS OF TV ON THE MOTION PICTURE THEATER

(*Continued from page* 17)

ment must, of course, be adaptable to existing theaters. In a survey of about 600 U.S. theaters, conducted by the SMPTE in 1938, an average screen width of 18 ft., 6 in. and an average ratio of maximum viewing distance to picture width of 5.2 was found.

An increase of average screen width to 24 ft. 0 in. would reduce the ratio of maximum viewing distance to picture width from 5.2 to 4.0 and would increase the screen area by about 67%. This change would be structurally feasible in the majority of existing theaters. It is true that in many of the existing theaters, the use of several of the front rows would be eliminated, but the seat loss would be nominal.

Elimination of Screen Masking

With reference to the elimination of black screen masking, observations by acknowledged authorities since 1920 have indicated the desirability of illumination of screen surroundings. The most desirable contiguous brightness has been found in practice to be the synchronous type which automatically varies with the brightness of the picture.

Some of the many examples of this type are the Island Theater, Bermuda; Crown Theater, New Haven; Essoldo Theater, Penge, England; and the Tacna Theater, Lima, Peru. Further developments and refinements for providing a synchronous luminous screen surround have been incorporated into several theaters now under construction, including the Shopping Center Theater in Framingham, Mass., and the Bellmore Theater, Bellmore, L. I.

Theater Location Trend

New motion picture theater construction in the U.S. has not been proportional with the increase of population. The growth of television is probably one of the factors which accounts for this. However, new population centers and obsolescence of theaters, both in plant and location, do create a demand for new theaters. Several recent developments have greatly affected the location and seating capacity of new theaters.

Since 1945, new residential planning has tended to be in the form of large-scale, integrated communities very often decentralized. Shopping and night-life centers are then located either within the new communities or on the periphery adjacent to highways.

The necessities for parking areas then become a major consideration in theater location. With high land values, it is difficult for new theaters in existing urban night-life centers to provide adequate parking facilities. There has, therefore, been a tendency to locate new theaters within the confines of the new communities or in the shopping centers.

When new theaters are located within the confines of new communities, they have the ease of accessibility of the neighborhood theater. The architectural planning of residential projects very often indicates the use of several smaller theaters, with capacities in the order of 400 to 600 seats, rather than a single large theater.

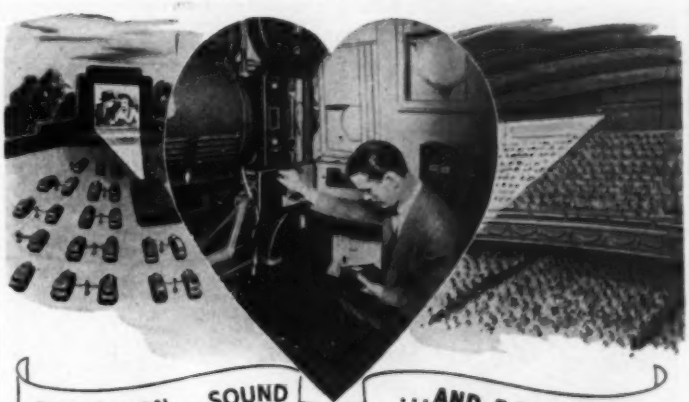
Smaller Theaters Desirable

The smaller theaters have fewer building code restrictions and are more eco-

Take Care of Your *Prints*

Gradual conversion to magnetic films for original sound recording should reduce somewhat the demand for fine-grain sound recording stocks. The synchronous ¼-inch tape systems should help even more, for they don't require consumption of motion picture film base. But since release films represent by far the largest share of the industry's production, there is the place to save.

Protect the HEART of your theatre with RCA Service...



The possible scarcity of new equipment makes it doubly important today that you safeguard and conserve your projection room equipment—*the heart of your theatre*. So, for top performance security, be sure your theatre is protected with an RCA Comprehensive Parts and Repair Plan.

It costs so little to protect so much

The advantages of RCA Service are yours at a cost so low, a few admissions daily pay for it. *Write for FREE folder—"Performance Security."*

RCA Service and Parts Plans cover all makes and types of theatre sound equipment, as well as motion picture projectors and accessory units.

RCA Service averts breakdowns and assures you of the ultimate in performance security. But if a theatre needs emergency service it is available 24 hours every day.

For drive-in theatres . . . in addition to a *preventive* maintenance plan for projection equipment . . . RCA has a replacement and repair plan on RCA In-car Speakers and Junction Boxes.

RCA SERVICE COMPANY, INC.
A RADIO CORPORATION of AMERICA SUBSIDIARY
CAMDEN, NEW JERSEY

nomical in per-seat-cost of construction. Their scale suggests simplicity of exterior treatment and amenities. They do have the virtue of intimacy within the interior of the theater and can achieve to the greatest degree the previous suggestions as to screen size and treatment. All of the seats can approximate the "ringside" seat.

Availability of screen product and allocation of runs to groups of smaller theaters is an industry policy question of great importance.

The location of theaters within new large-scale shopping centers has different aspects. Adequate parking facilities are available, the theater plays an important part in building up night activity, and there is, generally, considerable transient automobile traffic. This indicates a larger capacity theater.

To achieve intimacy in the larger theater is an achitectural challenge. Reduction of the interior volume of the auditorium to a minimum helps to create acoustical intimacy. Screen size is, of course, increased in the larger theater, and with it, the scale of the screen surround treatment is increased. This enhances the visual intimacy which is the prime consideration. Then, the shaping of walls and ceiling, the avoidance of decoration which gives scale "measuring rods" and the integration of interior lighting must attempt to approach intimacy of space.

Now and existing theaters which offer to the public the seating, air conditioning, projection and sound transmission comforts, which are now available, and which add to these the increased screen image, the luminous screen field, the increased flexibility and scope of motion picture cinematography, the feelings of intimacy within the auditorium, and stereoscopy of sound and vision, should survive within the forests of home television antennae which have become a feature of the skyline.

ONLY
Century
PROJECTORS
HAVE EVERYTHING
4-inch diam. lens mount
Water-cooled apertures
Oil-less Bearings
CENTURY'S high-efficiency projector with the NEW 4-inch diam. lens provides pictures of increased brightness and appeal—for even the largest drive-in screens.
CENTURY'S water-cooled aperture gives as much light with a 90 ampere arc as other projectors using a 180 ampere arc and heat filters!—Reduce power cost—Get sharper pictures—Save film.
CENTURY'S sealed, oil-less bearings and glass-hard gears reduce maintenance costs. No oil sprays or baths to mess up film or projection room.
You can SEE and HEAR the difference!
CENTURY PROJECTION AND SOUND SYSTEMS
See your dealer or write for information
JECTOR CORPORATION
New York, N. Y.
Century

NEVER HAS
Economy
BEEN SO
ESSENTIAL AS NOW!
THERE IS A LORRAINE CARBON TAILORED FOR YOUR SPECIFIC PROJECTION REQUIREMENT
Send necessary projection equipment data to guide us in recommending the Lorraine Carbons that will do your theatre or drive-in projection job better and More Economically
SLOW BURNING
SAVINGS IN POWER CONSUMPTION
SAVINGS IN MAINTENANCE
ECONOMIZE
WITH Lorraine Carbons
Lorraine CARBONS, INC., BOONTON, N. J.

Discussion:

PIERRE MERTZ: Some years ago, there was a development in films which seemed to cover something of what Mr. Schlanger had in mind with regard to the wide screen—the Grandeur film. That occurred before I came into this field. Can you tell us, what was the improvement in realism with the Grandeur film as compared with the conventional film?

MR. SCHLANGER: There are many factors involved. First, there was a larger physical width of film, and I believe since then the film grain problem has been more or less licked and that a sufficiently large picture can be projected from 35-mm width.

Present Screen Size Ample

The present standard gives a wide enough picture in theaters, and the real problem, which was not licked at the time that Grandeur and other wide, enlarged screens were presented, was the cinematographic problem. It is quite natural. It was a new tool and it never had its chance for the experience or practice that is needed with a new tool. In other words, the cinematographers never became familiar with the new tool or its potentials at that time.

Today we are in a spot where we know we need some new method or device, and, should we find it, the cinematographers will learn to use it.

As to the realism that can be achieved, there is another problem in addition to that of the size of film and the art of cinematography—that is the taking-lens in the camera. I remember getting in touch with some of the authorities and manufacturers of lenses to try to find out why there were not wider-angle lenses available or used in taking motion pictures, and the significant answer was that there was never any great demand for them. But it was possible to develop them. I do hope that they will develop wider-angle lenses, because that is another tool in the flexibility of cinematography that is necessary.

Drive-ins vs. Auditoriums

FREDERICK J. KOLB, JR.: Most of the desirable features of theater design that you have discussed seem directly contrary to the requirements of a drive-in theater. Is it possible to reconcile the two?

MR. SCHLANGER: Would you be specific as to their being contrary?

DR. KOLB: I am thinking of the drive-in theater as having a very limited angle of view—more like the home television viewing conditions. Therefore, the advantage to be gained by including a larger story element on the screen and by restricting the

audience to the most favorable locations seems very difficult—at least, to me—to realize in drive-in design.

MR. SCHLANGER: In drive-in theaters, the remote car positions are at least 10 *W* [*W* = screen width]. They are placed so because of the physical problem of getting enough attendance with one screen, and I have noticed that there have been some developments recently for double screens and even four screens. I guess that is one of the problems to be overcome.

From a 10 *W* location in a drive-in theater, the picture looks like a postage stamp. It is not that it is poorly done. It is an inconspicuous speck in the field of view. However, the drive-in theater is a unique experience—to be able to ride out in your car and go and view a picture is still "something different." The audience will tolerate a lot when a thing is unique enough.

'Unique' Angle of Home Tv

For example, even home television, good as it is today, falls far short of the quality of a motion picture in a theater. But it is tolerated; it is considered all right because it is unique. You can sit in your slippers, smoke a cigar and watch television without leaving your house.

Getting back to your question—can you produce a picture which is just as useful in a drive-in theater as in any other theater? There is an inconsistency in this respect and it can be related also to television viewing. Due to the deficiencies in television viewing there is a tendency, and justifiably so, to use closeups, because middle and distance shots appear indistinct.

For the same reason, middle and distance shots in drive-in theater production should also be avoided. There again, a predominance of close-up shots is a desirable thing, if drive-in theaters are going to be designed with 10 *W* viewing. So, you are correct.

Picture Content Compromise

A picture which would be photographed carefully for a drive-in would not be good for regular motion picture theaters, but there is always a happy medium. You must be sure that the close-ups are not too close up, and that the distant shots are not too distant. You have to compromise, and I believe that this could be done easily enough so that there would be neither too many close-ups for viewing in the regular theater, nor too few, for the drive-in theater.

WALTER E. DUNN: You have made repeated references to the elimination of black screen masking. Do you have any recommendation for either a substitute or a system of elimination of the mask in an existing theater?

Luminous Screen Masking

MR. SCHLANGER: There are several methods of eliminating black masking. First of all, we have to realize that black maskings were originally created for purposes which no longer exist. One was that screen illumination in the early days was comparatively low and the black masking went a long way toward making the illumination appear brighter.

I think that television viewing is proving that black masking is no longer necessary.

EFFICIENT • DEPENDABLE

RECTIFIERS

for Every Type Projection Lamp

2-Tube
4-Tube
6-Tube
Single and Three Phase Models for

- Rotating Feed Angular Trim High Intensity
- Copper Coated Coaxial High Intensity
- 1 K.W. High Intensity
- Low Intensity

Smooth Output Current · Long Life
Low Operating Temperature
Flexibility in Control

Write today for literature or free demonstration.

THE STRONG ELECTRIC CORP.

31 CITY PARK AVENUE
TOLEDO 2, OHIO

PROJECTION LAMPS · RECTIFIERS
SPOTLIGHTS · REFLECTORS

TODAY'S CRITICAL THEATREGOERS

demand sparkling bright pictures . . . which means that if you have a giant-size screen, you must use Motiograph Hi-Power 75/115 ampere Arc Lamps. They assure brilliant pictures of unwavering intensity—much more light at much less cost—more screen lumens at 100 amperes—with better distribution—than condenser type lamps operating at 180 amperes with heat filters . . . and carbon costs are less than half. Furthermore they can be operated with less expensive current conversion equipment.

For convincing proof, request a free demonstration in your own theatre. For smaller screens, Motiograph also has 46 ampere lamps and 40 ampere lamps.

For free literature address

MOTIOGRAPH, INC.

"America's Oldest Manufacturer of Projection Equipment"

4431 WEST LAKE STREET CHICAGO 24, ILLINOIS

With the exception of the Du Mont sets, practically all the sets have a white or almost-white color masking.

The other reason for black masking was to do something about the aberrated or fuzzy edge of the picture as it is when projected without a black masking. That is a practical problem. This aberrated, fuzzy edge can be eliminated in several ways.

We have been developing a substitute masking, a luminous masking, which I think will be available very soon. We have also had other solutions in which we would cut the picture, that is, project the picture very carefully into a proscenium which was exactly the size of the picture and let it go at that, or by having a slight flare come right out from the picture. The fuzzy edge would fall on the angular surface, which would not be visible to the audience, and the picture would appear to have a clean-cut edge. Some of the newer maskings that have been developed will do an even better job.

Screen Brightness vs. Size

LEONARD SATZ: There are certain things which can be done right now, short of making major changes. I would say, principally, modernization of lighting would be the first step in the theater auditorium—the elimination of distracting side-wall brackets, which are so common in many of our theaters, and replacement with an operating light which is directed downward and perhaps intentionally directed to the proscenium area.

The first step would be, naturally, the enlargement of the screen, and I believe it is a fact that visual acuity is not lost by the reduction in screen brightness as long as the image is increased in size. You mentioned limitation of screen brightness as being one of the problems of the exhibitor today. I think that if he does lose 10% in incident illumination by enlarging his picture with existing projection equipment, the loss will be compensated by the fact that visual acuity is maintained with the larger picture.

MR. SCHLANGER: It may not be exactly compensated, but certainly acuity increases with the size of the image, despite loss in light. I don't have exact figures on that, but I believe you can verify it.

FILM-GUIDING METHODS

(Continued from page 6)

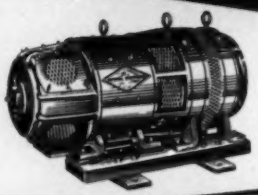
The use of "studio guides" in theatre projectors is subject to criticism. Guide rails which have been in use for a period of years reveal a small amount of grooving, with one of the two rails grooved more than the other. Because the rails are supposed to be set just far enough apart to clear a new, unshrunken film, the minutest grooving ruins the adjustment, rendering the rails useless unless they are *misaligned* relative to the guide roller so that one rail brings up snugly against the edge of the film.

A groove of only 0.001 inch in each of the two rails permits a side-sway of as much as 0.6 inch in a 24-foot picture. This is noticed by the audience if the swaying is rapid; and it is likely to be more rapid and irregular when studio guides are used than when they are dispensed with entirely.

Most of the films run in the average theatre, moreover, are not new prints. They are narrower than the original raw stock because of shrinkage and the inevitable microscopic shearing that comes of repeated use. Tests have provided conclusive evidence that both the shrinkage and the edge-wear are, within limits, *irregular*. When old prints are projected, therefore, the guide rails are not effective except as they may be misaligned, forcing the film into a fixed position.

To set the rails closer together to edge-guide old prints effectively would

IMPERIAL STEDYPOWER



"THE POWER BEHIND THE SCREEN"

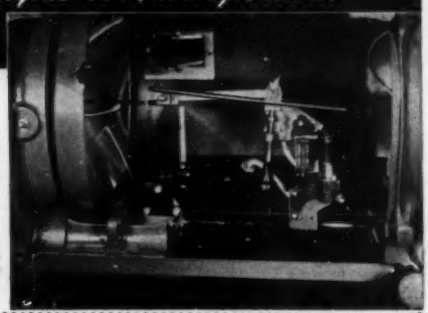
SPECIAL MOTOR GENERATORS FOR EVERY ARC PROJECTION

- Proven "Trouble Free" Performance
- Quality Built, Quiet Operation
- *"Rubber in Shear"* Mounted Vibration Free
- Long Life, Low Maintenance

Distributed by Independent Theatre Supply Dealers or Write to:

THE IMPERIAL ELECTRIC CO.
AKRON Imperial OHIO
SINCE 1889

This is the CARBON SAVER Everyone Is Talking About!



Start now to conserve your supply of carbons which have the heavier copper coating. Now, more than ever, it is important that you make use of every inch of every carbon, and here's the carbon saver that really does the job.

THE CRON-O-MATIC FULLY AUTOMATIC CARBON SAVER

uses up carbon stubs of all lengths with no preparation required. Simply insert in the holder and forget it. It in no way interferes with the regular operation of the lamp. CUTS CARBON COSTS 25%.

Adaptable to Ashcraft "D", Brenkert-Enarc, Peerless Magnarc and Strong Mogul lamps.

Only $52.50. Quickly pays for itself . . . then goes on to make money for you.

If your theatre equipment dealer cannot supply you, order direct.

PAYNE PRODUCTS COMPANY
Cron-O-Matic Division
2454 W. Stadium Blvd. Ann Arbor, Michigan
( ) Please send free literature on Cron-O-Matic Carbon Saver.
( ) Send name of nearest dealer.
( ) Please ship Cron-O-Matic Carbon Saver,
( ) C.O.D. including postage, ( ) Remittance herewith.
NAME .....
THEATRE .....
STREET .....
CITY & STATE .....
Dealer Inquiries Invited

make the passage of splices through the gate more conspicuous on the screen, and also cause new, unshrunken films to buckle and flutter.

Then, too, it is difficult to understand how the flanged guide roller can function freely and properly when studio guides are used. The slightest displacement in the lateral positioning of this roller automatically misaligns the guide rails.

Motiograph, happily, abandoned studio guides altogether in the Motiograph AA, introduced in 1947. The two guide-roller assemblies used in the AA function so well that not a single report of side-sway has come in from nearly 3000 installations. The writer holds that the use of two guide rollers is mandatory in all high-grade projectors.

Provisions for quickly adjusting the pressure of the tension pads of the gate are now incorporated into several projectors. The Brenkert models, for example, and the Simplex E-7 and the new X-L, have conveniently located adjustment screws for this purpose. The Motiograph AA has a positive-acting tension adjustment which can be instantly set in any of three pre-determined positions to obtain the best results with new, old, or only moderately worn prints, thus eliminating all guesswork.

Another noteworthy feature of modern projector gates is the special framing aperture located at the top of the film gate. In the Motiograph AA this threading-up aperture is inclined at a convenient angle so that the projectionist need not be a contortionist in order to thread the film "in frame."

Regardless of the make and model of the projectors used, the projectionist can do much to keep the film gate in perfect condition, thereby insuring good intermittent action and satisfactory functioning of the lens. A few suggestions:

Suggested Projectionist Procedure

1. Cleanliness and Lubrication. Keep all parts of the gate scrupulously clean at all times. The tension pads of the gate door should be taken out for thorough cleaning—dust from the film lodges underneath them. Remove hardened deposits of emulsion from the film runners with a scraper made from soft copper wire, wiping off the residue with carbon tetrachloride or cleaner's naphtha. (*Caution!* Carbon tet is very poisonous; naphtha is inflammable).

A small drop of projector oil applied to the guide-roller shaft and pivots will insure proper rotation. A toothpick can be used for applying the oil. The slides of the gate door should also have a thin film of oil on their surfaces. Light oil is best avoided—the heat of the gate causes it to vaporize and fog the lens.

The steel film tracks and tension pads may be lubricated every few months by rubbing the metal surfaces which contact the film with a trace of heavy Vaseline. Excess grease should be wiped off with a clean cotton cloth—enough of the lubricant will sink into the pores of the metal to be effective for a long time.

2. Pad Tension. If the projectionist has had long experience with the make of projector he is using, he can test the tension of the gate-door shoes with his fingers. A more accurate test can be made by determining the drag on the film with a small cylindrical spring scale

Attach a 1-foot strip of film to the hook of the scale, and pull the film up through the closed gate by means of the scale. The reading indicates the pressure exerted on the film by the pads.

Proper Pad Pressure

From 12 to 16 ounces of pressure is recommended for the average well-seasoned print. Too little pressure may result in an unsteady picture; too much will wear out the film and notch the teeth of the intermittent sprocket. The pads on each side should exert equal pressure—from 6 to 8 ounces—else sideway may be introduced into an other-

ANSWER TO YOUR TECHNICAL PROBLEMS...

The Altec Service Man

The Altec Service Man and the organization behind him

ALTEC SERVICE CORPORATION

161 Sixth Avenue,
New York 13, N. Y.

PROTECTING THE THEATRE—FIRST PLACE IN ENTERTAINMENT

CLAYTON BALL-BEARING EVEN TENSION TAKE-UPS

For all projectors and sound equipments

All take-ups wind film on 2, 4 and 5 inch hub reels.

Silent Chain Drives

THE CLAYTON REWINDER

For perfect rewinding on 2000-foot reels.

CLAYTON PRODUCTS CO.

31-45 Tibbett Avenue **New York 63, N. Y.**

wise perfect picture A foot-long strip of film cut lengthwise through the middle is used for testing each side separately.

When there are upper and lower sets of pads (as in all machines except the Powers), the pads at the aperture should exert almost twice as much pressure as the upper set of pads. This makes for a steadier picture, reducing side-sway and film-flutter to a minimum.

Check each pad frequently for surface wear. Replace worn pads immediately, for they can ruin the stationary film-runners, hollowing them here and there, and cause in-and-out-of-focus flutter of the film

3. INTERMITTENT SHOE. In some projectors the intermittent shoe is part of the gate door; in others it is a separate component. In either case it should be examined for lateral adjustment. Although several projectors have adjustable shoe tension, the writer does not believe that the amount of pressure exerted by the shoe against the face of the sprocket is of much importance It is only necessary that the film be held snugly against the intermittent sprocket; the lightest pressure suffices to do this.

If the shoe rubs against the sides of the sprocket teeth it will damage them, and also deface the film perforations, Center the shoe so that no loud intermittent noise is heard when the machine is run without film, and with the intermittent shoe closed against the sprocket.

Tests of Film Runners

4. FILM RUNNERS. The two steel strips upon which the film rests during its passage through the gate will in time show signs of wear. Ordinary steel runners wear out rather quickly; alloy-steel runners of the nickel-molybdenum type are good for years; while runners specially ground from tool steels of the uranium-cerium type have an enormously long life.

The friction of moving film causes the runners to become grooved, a defect which may be detected by scraping a sharp-edged copper coin across each runner laterally. A "click" indicates grooving. Grooving may also be detected by feeling the runner surfaces with the fingers—the sense of touch in the fingertips is extremely delicate.

Wear of the runners is greatest, of course, where the tension pads press the film against them. Such wear is evidenced by a hollowing, best detected by placing a short steel straight-edge against the runner and shining a flashlight on the casting behind it. The straight-edge used for this purpose should be of the best quality, and kept in a velvet-lined box.

A hollow of the runners in the vicinity of the aperture can throw one edge or, more frequently, one corner of the projected picture out of focus. The writer has encountered and corrected this defect several times. All that is needed is a new pair of runners.

Grooved and hollowed-out runners should be replaced *immediately* with new ones. Some "off-make" parts are very good, but the projectionist must rely on his own judgment when ordering them. In the days to come we will be very lucky to get any parts we need!

When only one runner appears to be worn, it is a good idea to replace both of them, and re-check the evenness of pad tension. In certain projectors the runners and aperture-plate assembly are combined in a single block of ground and hardened steel. The entire unit can be removed and replaced in a moment.

Guide Rails, Rollers

5. GUIDE RAILS. The rails of studio guides are subject to grooving by the edges of the film, and hence must be reset and replaced at intervals. The clearance must be such that a new, unshrunken film can just squeeze in between them without binding or buckling.

6. GUIDE ROLLERS. Failure of the guide rollers to turn invariably results in scored flanges. These, as well as bent flanges, cause side-sway; replace immediately. If the assembly is properly lubricated, failure of the guide-roller shaft to rotate calls for examination of the pivot bearings. They should not hold the roller so tightly that the film cannot impart a rotary motion to the flanges. On the other hand, there should be no end-play in the roller shaft. Anything wrong with the guide roller, or with the way it is held in the gate, is certain to spoil the quality of the picture.

Lateral adjustment of the guide-roller assembly is usually made with the set-screw in the collar of the "fixed" flange —not with the pivots. It sometimes happens, however, that the position of the pivots needs correction. Care must be taken, when working on them, not to let them drop into the mechanism or onto the floor and get lost! As all projectionists know, the lateral positioning of the guide roller is very critical, and is correct only when the picture is perfectly centered on the screen. Instructions of the projector manufacturer should be followed when making this adjustment.

The guide-roller spring should press only very lightly against the movable flange. Too great a tension will cause a tendency of the film to "pinch out" or buckle in the gate. The remedy is to take the spring from the assembly and cut away a few turns of the coil. And, just as a precaution, have a few extra guide-roller springs in the spare-parts cabinet.

Extreme care must be exercised whenever the gate door is removed from the "gate-door holder" of the old-style projectors. The screw-holes of the holder are large enough to permit considerable variation in the position of the gate door and its associated intermittent-shoe apron. Unless the correct position is secured, by intention or a lucky accident, the shoe will rub against the intermittent sprocket teeth.

How Many?

Was this copy dog-eared when it came to you? How many men read it ahead of you?

You would receive a clean, fresh copy *if* you had a personal subscription—and you wouldn't have to wait—you would be first to read it.

Use coupon below.

INTERNATIONAL PROJECTIONIST,
19 West 44 St., New York 18, N. Y.

Enter my subscription for ☐ **1 year—12 issues—$2.50** ☐ **2 years—24 issues—$4.00**

Foreign and Canada: Add 50c per year.

Name .....

Address .....

City ..... *State* .....

"The bonds William and I bought for our country's defense helped build a house for us!"

HOW U. S. SAVINGS BONDS PAID OFF FOR MRS. ROSE NYSSE OF BRISTOL, PA.

"There's nothing more wonderful than a house and garden of your own," says Mrs. Nysse. "And there's no surer way to own one than to save for it through U. S. Savings Bonds and the Payroll Savings Plan!"

Mrs. Rose Nysse says, "In 1942 William and I started making U.S. Savings Bonds a part of our plan for financial security. I joined the Payroll Savings Plan at the Sweetheart Soap Co. where I'm a supervisor, and began buying a $100 bond each month. I knew that my money was safe and working for me all the time. Buying U. S. Savings Bonds is one of the surest, safest savings methods!"

"Savings Bonds alone made a $5,000 down payment on our house!" says Mrs. Nysse. "Altogether, we've saved $8,000 just in bonds bought through Payroll Savings, and we're keeping right on with the plan. And when we retire, our bonds will make the difference between comfort and just getting by. Bond buying is a patriotic and practical way of building a cash reserve!"

You can do what the Nysses are doing —the time to start is now!

Maybe you can't save quite as much as William and Rose Nysse, maybe you can save more. But the important thing is to *start now!* It only takes three simple steps.

1. Make the big decision—to put saving *first*—before you even draw your pay.

2. Decide to save a regular amount *systematically*, week after week, or month after month. Even small sums, saved on a systematic basis, become a large sum in an amazingly short time!

3. Start saving automatically by signing up *today* in the Payroll Savings Plan where you work or the Bond-A-Month Plan where you bank. You may save as little as $1.25 a week or as much as $375 a month. If you can set aside just $7.50 weekly, in 10 years you'll have bonds and interest worth $4,329.02 cash!

You'll be providing security not only for yourself and your family, but for the blessed free way of life that's so important to us all. And in far less time than you think, the financial independence the Nysses enjoy will be yours to enjoy as well!

FOR YOUR SECURITY, AND YOUR COUNTRY'S TOO, SAVE NOW— THROUGH REGULAR PURCHASE OF U. S. SAVINGS BONDS!

Your government does not pay for this advertisement. It is donated by this publication in cooperation with the Advertising Council and the Magazine Publishers of America as a public service.

Wise Buy!

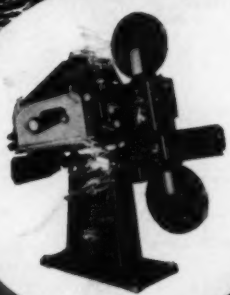
FOR THE

DRIVE-IN

THEATRE

De Luxe
IN-A-CAR
SPEAKER

Standard
IN-A-CAR
SPEAKER



Simplex

PROJECTION and SOUND SYSTEMS

PATRONIZE YOUR LOCAL MOVIE THEATRE FOR THE BEST IN ENTERTAINMENT

MANUFACTURED BY INTERNATIONAL PROJECTOR CORPORATION • DISTRIBUTED BY NATIONAL THEATRE SUPPLY